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Washington, DC

Contents

List of Tables

List of Figures

Chapter 1

Introduction

Institutions are the "rules of the game" in economics. They set the parameters in which economic activity takes place. Institutions come in many forms. They may be formal such as constitutions, laws and regulations. They may be informal such as cultural norms, codes of conduct and traditions.[1] They also come at different levels of analysis. Williamson (1998, 2000) identifies four such levels – the top level comprises the social embeddedness level where informal institutions such as norms, customs, traditions, etc. are located; the second level is dubbed the institutional environment and refers to the formal rules of the game such as laws, bureaucracy, and property rights; the third level is referred to as play of the game and concerns itself with governance structures related primarily to contractual relations; finally, the fourth level contains the continuous and marginal resource allocation and employment and is the domain of neoclassical economic analysis.

This thesis explores the role of institutions in international finance. In particular, it considers institutions of the type 1 and 2 level – informal ones and the formal ones that make up the institutional environment – and how they influence international capital flows on the one hand and financial access across developing countries on the other hand. Each of the following three chapters examines how a certain institution shapes in turn foreign direct investment, international bank lending, and access to finance for firms.

Chapter 2 examines the role of immigrants as an informal institution in promoting foreign direct investment (FDI). While the role of formal institutions such as the rule of law, corporate governance, and financial sector development has featured prominently in explaining international capital flow patterns,[2] little consideration has been given so far to the role migrant networks. An emerging literature on social networks suggests that, similar to co-ethnic networks, migrant networks can help overcome information barriers to international capital and trade flows and may so increase FDI flows to their country of origin. Because of the magnitude of migration flows in our time (see Hatton and Williamson, 2005) and given the surge in international capital flows in the last two decades (see Prasad et al., 2007), understanding whether there is a discernible pattern between those two factor flows is of great economic interest.

This chapter extends the evidence that more narrowly defined co-ethnic social networks promote international investment to more general ethnic networks, namely migrant networks. Using a gravity model and panel data on 180 countries, it finds that immigrants and FDI flows are complements in the context of Dutch data. In the preferred specification, a 1 percent increase in the number of immigrants in the Netherlands increases the Dutch

[1] See North (1991)

[2] See, for example, Kose et al. (2006) and Prasad et al. (2007) for an overview.

FDI stock in their country of origin by 1.08 percent. The effect is strongest for second generation immigrants with one parent born abroad. A 1 percent increase in the number of second generation immigrants with one parent born abroad increases the Dutch FDI stock by 1.68 percent. Furthermore, keeping the total number of immigrants constant, a 1 percent increase in the share of second generation immigrants with one parent born abroad raises the Dutch FDI stock by an additional 0.1 percent. The sign and significance of the immigrant variable is robust to a range of robustness checks though the size of the coefficient does vary. Our robustness checks also suggest that countries may have to reach a certain threshold level of governance quality for immigrants to play a significant role in promoting FDI.

Chapter 3 examines the role of institution in promoting international bank lending before and after the global financial crisis of 2008. In this chapter institutions are understood as measuring the effectiveness and stability of political, legal, and bureaucratic circumstances in a country. As noted above, the role of institutions such as rule of law has featured prominently in explaining international capital flow patterns. The chapter extends this literature specifically on international bank flows[3] by studying the relationship not only during periods of expanding international bank lending but also during a period of sharp falls in such lending.

Using a panel of bilateral cross-border bank flows to up to 136 countries between 1984 and 2009 the results indicate that there appears to be an asymmetric relationship between institutional quality and cross-border bank flows during periods of boom and bust in international bank lending. The results confirm earlier findings in the literature that better institutions promote cross-border bank lending in the years leading up to the financial crisis. This includes the period of rapidly rising flows from 2003 to 2007, a period that previously had not yet been studied in this context. The results, however, also indicate that this relationship breaks down during and in the immediate wake of the financial crisis of 2008. The positive relationship disappears in the overall sample, and, driven by flows to high-income, high institutional quality OECD countries, indeed even turns negative. This finding holds across a number of specifications and several robustness tests. Interestingly, the relationship does not completely break down when only considering a sample of emerging markets vis-à-vis countries. Emerging markets countries appear to still hold an advantage in attracting cross-border bank lending flows. However, after the onset of the crisis a better institutional environment only promotes international lending inflows at a

[3]See, for example, Alfaro et al. (2008) and Papaioannou (2009).

quarter of its pre-crisis rate. The findings are the result of surveying the immediate effects in the crisis and nascent recovery period. By necessity, the results are therefore tentative. However, they do provide a first glimpse at the asymmetrical impact institutions can have during boom and bust periods in international bank lending.

Finally, Chapter 4 explores the relationship between financial structure and access to finance for firms across developing countries. Here the market structure of the financial sector as shaped by legal rules and environmental circumstances sets the institutional background for access to finance for firms. As small and medium enterprises make up a large part of the emerging private sector in most developing countries but are also more constrained in their access to financial services than large firms, the relationship between financial structure and access to finance, especially for small and medium enterprises, is a critical question for policy makers (Ayyagari, Beck and Demirgüç-Kunt, 2007; Beck, Demirgüç-Kunt and Maksimovic, 2005).

Combining two unique data sets, the chapter explores in particular how two measures of financial structure – relative importance of different financial institutions as measured by their asset share relative to total assets by financial institutions and average asset size of financial institutions – relate to the three firm-level access to finance measures use of account, overdraft facility or loan. Two findings stand out in the analysis of the three financial institution categories considered. First, the dominance of banks in most developing and emerging markets is associated with lower use of financial services by firms of all sizes. Low-end financial institutions and specialized lenders seem particularly suited to ease access to finance in low-income countries. Second, there is no evidence that smaller institutions are better in providing access to finance. To the contrary, larger specialized lenders and larger banks might actually ease small firms' financing constraints, but only at low levels of GDP per capita. The results, while tentative, send the policy message that a diversified, competitive financial system is desirable.

Williamson (2010, p.611) notes in his overview of the state of new institutional economics that "its many accomplishments notwithstanding, there is a vast amount of unfinished business – refinements, extensions, new applications, more good ideas, more empirical testing, more fully formal theory." This thesis hopefully makes a small contribution to the literature.

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Chapter 2

Do Immigrants Promote Outward Foreign Direct Investment? Evidence from the Netherlands[1]

[1]This chapter is based on joint work with Jenny Ligthart (Tilburg University). We are grateful for comments from Thorsten Beck, Volker Nitsch, Manuel Oechslin, Maurizio Zanardi, seminar participants at Tilburg University, and conference participants at the 65th Congress of the IIPF in Cape Town. We thank Henk Prins of the Dutch Central Bank for making available the FDI data.

2.1 Introduction

While the role of formal institutions such as the rule of law, corporate governance, and financial sector development has featured prominently in explaining international capital flow patterns,[2] little consideration has been given so far to the role of informal institutions, such as co-ethnic or migrant networks. In the context of foreign direct investment (FDI) the long neglect is perhaps due to the assumption in some standard trade models of trade and factor flows, including migration and FDI flows, being substitutes; either capital moves to the workers or workers move to the capital and more of one leads to less of the other.[3] An emerging literature on social networks suggests that migrant networks can help overcome information barriers to international capital and trade flows and so may actually increase FDI flows to their country of origin. Migrants and FDI may in fact thus be complements. The focus of this study is to provide an empirical underpinning of this relationship.

With his work on the Maghribi traders that operated in the Mediterranean region in the 11th century, Greif (1989 and 1993) has established that co-ethnic networks can promote international trade and investment through the provision of community sanctions that deter contract violations in weak legal environments. Gould (1994) and Rauch and Casella (2003) stress that co-ethnic networks promote international trade and investment by reducing agency and transaction costs. Their works emphasize the role such networks play in providing and relaying information as well as supplying matching and referral services. The provision of such services through networks significantly lowers the cost associated with trading with or investing in foreign environments with a weak legal infrastructure. Gao (2003), in the context of FDI into China, adds that this is also important in an environment where foreign investors are to a high degree unfamiliar with the host country's regulations, language, and customs. The literature on the role of co-ethnic networks in promoting international trade and investment has particularly focused on the overseas Chinese network. This is due in part to the sheer size and strength of the Chinese network (see Rauch and Trindade, 2002) as well as China's role in the world economy and the paramount importance of interpersonal relationships for successfully conducting business in China (Wang, 2001).[4]

[2]See, for example, Kose et al. (2006) and Prasad et al. (2007) for an overview.

[3]See for example Kugler and Rappoport (2011). Javorcik et al. (2011) note that depending on the underlying assumptions regarding technology, factor endowment and mobility, trade and factor flows can emerge as either substitutes or complements in the literature. Markusen (1986), for example, argues that the assumption of substitutability is a special case of factor proportions models.

[4]Studying FDI flows into China, Gao (2003), for example, includes the size of ethnic Chinese net-

The role of more generally defined ethnic social networks, however, such as immigrant networks, has been under-researched. Yet, because of the magnitude of migration flows in our time (see Hatton and Williamson, 2005) and given the surge in international capital flows in the last two decades (see Prasad et al., 2007), understanding whether there is a discernible pattern between those two factor flows – thereby extending the result of more narrowly defined social networks to migrant networks in general – is of great economic interest. Recent contributions in this field have been made by Javorcik et al. (2011) and Kugler and Rapoport (2007), who both analyze the effect of immigrant networks on outward FDI by the United States in a cross-country context.[5] The results in the literature have been mixed so far. Javorcik et al. (2011), who measure FDI both by total assets and total sales for 1990 and 2000, do not find a significant effect of the total number of migrants on country-level FDI.[6] However, Kugler and Rapoport (2007), regressing US FDI outflows on the stock of migrants, find a significant effect.

This chapter examines to which degree immigrants in the Netherlands determine the outward FDI their country of origin receives using a unique data set for the Netherlands.[7] To this end, we specify a gravity model that is augmented by the stock of immigrants in the Netherlands to proxy the network effects on outward Dutch FDI (which is taken as a stock rather than a flow). We also include a governance variable to assess whether there is an effect of immigrants on FDI above and beyond the quality of institutions. The data set employed in our study spans 180 host countries of FDI for the 1997–2006 period. To address year-to-year volatility in FDI, we employ a panel data model based on two waves of averaged data.

This chapter contributes to the literature by explicitly controlling for the selection bias that is introduced by the small data sets used by previous studies. Unlike Javorcik et al. (2011) and Kugler and Rapoport (2007), who use data sets consisting of roughly 50–60 countries, our data set has a much broader country coverage and includes many developing countries that receive small amounts of FDI and send few migrants. Previous studies also drop all countries for which FDI and/or migrant data are zero or not available. Because

works in the source countries as an explanatory variable in the regression analysis. In a related line of research, Tong (2005) investigates the role of ethnic Chinese networks in facilitating FDI among 70 different countries.

[5] In a closely related line of research Buch et al. (2006) examine the link between migration to and FDI flows into Germany from the perspective of agglomeration.

[6] Once they disaggregate the FDI data by country and industrial sector, the estimated coefficient on the migrant variable indicates that a 1 percent increase in migrants increases FDI by about 0.5 percent.

[7] The Netherlands is one of the major FDI source countries (UNCTAD, 2007) and has a substantial population share of immigrants (19 percent in 2006).

of the extensive country coverage, the Dutch data include a non-negligible number of zero FDI observations (roughly 40 percent), which raises the issue of censoring. Standard linear estimators cannot account for censoring, yielding a downward bias in estimated coefficients. We therefore employ the more appropriate Tobit model.[8] We also contribute to the literature by testing whether the generational composition of immigrants has a differential impact in promoting outward FDI and whether immigrant networks promote outward FDI to a greater extent into countries with weaker institutions.

As suggested by the literature, we test for the potential endogeneity of the immigrant variable. The presence of immigrants may increase FDI to their home country but FDI could also hinder or encourage migration. In addition, we test for the potential endogeneity of the governance variable, that is, the possibility that FDI may cause good governance instead of good governance contributing to FDI. To control for endogeneity, we employ an instrumental variables (IV) Tobit analysis. While these forms of reverse causality are certainly plausible in an analysis that models *aggregate* FDI inflows, we are skeptical that the FDI inflow from one country alone, particularly if it is small such as the Netherlands, may actually increase emigration from or governance quality in the FDI recipient country.[9]

Our findings can be summarized as follows. We find that immigrants and country-level FDI flows are complements at the aggregate level: a 1 percent increase in the number of immigrants in the Netherlands increases the Dutch FDI stock in their country of origin by 1.08 percent. The effect is strongest for second generation immigrants with one parent born abroad. A 1 percent increase in the number of second generation immigrants with one parent born abroad increases the Dutch FDI stock by 1.68 percent. Furthermore, keeping the total number of immigrants constant, a 1 percent increase in the share of second generation immigrants with one parent born abroad raises the Dutch FDI stock by an additional 0.1 percent. Our results do not markedly change when we instrument immigration and we do not find any evidence for the endogeneity of the governance variables. The sign and significance of the immigrant variable in the panel Tobit framework is invariant to a range of robustness checks. The results also suggest that countries may have to reach a certain threshold level of governance quality for immigrants to play a significant role in promoting FDI.

The chapter is organized as follows. Section 2.2 explains the empirical methodology.

[8] Javorcik et al. (2011) estimate a log-linear model by ordinary least squares (OLS). Kugler and Rapoport (2007), however, use an OLS first difference specification.

[9] One could argue that endogeneity is more of a concern for the United States (which is the largest source country of FDI) than for a relatively smaller but still significant source country, such as the Netherlands. Indeed, Javorcik et al. (2011) find evidence of endogeneity for the United States.

Section 2.3 discusses our data sources and section 2.4 presents the empirical results. The chapter concludes with a summary of our findings and directions for future research.

2.2 Empirical Methodology

We start by motivating and presenting the empirical model we use to estimate the effect of immigrants on the stock of outward FDI. We then discuss how we address censoring and potential endogeneity in the data.

2.2.1 Empirical Model

To isolate the effect immigrants have on outward FDI we add a migrant variable to a standard empirical specification of country-level outward FDI determinants. The literature on determinants of FDI is "quite substantial, though arguably still in its infancy" (Blonigen, 2005, p. 29). The interaction of FDI and trade flows as well as the underlying motivations for multinational firms to invest abroad makes analysis difficult.[10] There are no agreed theoretical models guiding the empirical analysis (see Singh and Jun, 1999; Bevan and Estrin, 2000).[11] Nevertheless, some stylized facts have emerged in the empirical literature on country-level determinants.

The theoretical literature puts forward two reasons why a firm would want to invest abroad. One is to take advantage of international differences in factor prices by splitting the production process between several locations. This is referred to as vertical FDI and was first modeled by Helpman (1984). The other, horizontal FDI, is to avoid transportation and other costs associated with cross-border trade by supplying a market directly by an affiliate. Markusen (1984) provides an early model of FDI motivated by the latter reason. The two motivations for FDI, however, give conflicting predictions about how some country characteristics affect FDI. The theory of horizontal FDI predicts a positive relationship between the volume of FDI and similarity in country characteristics between source and destination countries, whereas the theory of vertically motivated FDI predicts a negative relationship. Conflicting predictions also arise for trade costs: whereas the theory

[10] For a comprehensive overview on the theory of the behavior of multinational firms and determinants of FDI see, for example, Barba Navaretti and Venables (2004).

[11] Table 1 in Chakrabarti (2001) tellingly illustrates this point. Looking at eight proposed determinants of FDI the table lists studies according to whether they have found a positive, negative, or insignificant relationship for each determinant. See his paper also for a review of host country FDI determinants.

of horizontal FDI predicts a positive correlation, theory predicts a negative correlation for vertical FDI (Barba Navaretti and Venables, 2004).

One way in which the literature addresses the problem of conflicting predictions is to specify an empirical model that encompasses both theories.[12] A model that accounts for both vertical and horizontal FDI is the knowledge-capital model by Markusen (most fully developed in Markusen, 1997, 2002)[13] and estimated by Carr et al. (2001). The model explains affiliate sales in terms of the sum of aggregate GDP proxying market size, the squared difference between aggregate GDP, a measure of skill difference capturing differences in labor costs, skill difference interacted with the difference in aggregate GDP, and variables measuring trade costs and investment barriers. Note that affiliate sales capture the same concept as FDI flows, namely the extent of operations a firm carries out abroad (Barba Navaretti and Venables, 2004); it is thus an alternative measure used in the literature.[14]

Another way to model FDI empirically is the gravity model (Tinbergen, 1962). Because of its simplicity and success in explanatory power,[15] the gravity model is the most widely used empirical model in the literature for explaining bilateral FDI or trade volumes (Wei, 2000). In its basic form, the gravity model states that the amount of FDI between two countries is directly related to the sum of their economic size, usually measured by aggregate GDP and is inversely related to the distance between them. In addition to those basic factors, gravity models often include other variables that either promote or deter FDI such as dummy variables that indicate a special relationship between country pairs such as colonial ties, a common official language, or sharing an international border. More recently, it has also become common to control for (formal) institutional quality in gravity model specifications.[16] And although the theoretical foundation of gravity models may not

[12]There are two other ways in which the literature on FDI determinants addresses the problem of conflicting predictions. The first is to accept that FDI data contains both types of FDI and that regression analysis reports an averaged effect. The second one is to split FDI data between vertical and horizontal FDI. The second approach might be the theoretically most sound specification. However, the separation of FDI data is generally not possible (Baraba Navaretti and Venables, 2004).

[13]See, for example, Barba Navaretti and Venables (2004) for a literature review of other works that have contributed to the development of the knowledge-capital model.

[14]The knowledge-capital model represents an analytical formalization of the OLI framework as developed by Dunning (1977), which states that a firm invests abroad if it has market power through the ownership (O) of products or the production process; it has a location (L) advantage if producing abroad; and lastly it has an advantage internalizing (I) its foreign activities rather than licensing or selling its products or process to a foreign firm.

[15]See, for example, the meta-analysis of gravity models on goods trade by Disdier and Head (2008).

[16]Wheeler and Mody (1992) are an early example of studying the impact of formal institutions on FDI. Using a composite host country risk factor that includes, among others, perception of corruption, the

be as obvious as the one of the knowledge-capital model discussed above, it has been shown that they are consistent with theoretical models (see Anderson, 1979; Deardorff, 1995).

Given its workhorse status, we use the gravity model as empirical backdrop for examining the effect immigrants have on outward FDI. Because we only use outward FDI from the Netherlands, we do not include any variables that directly pertain to the Netherlands; this information is constant across all countries. This gives us the following empirical specification:[17]

$$\begin{aligned} \ln \text{Outward FDI}_{it} &= \beta_0 + \beta_1 \ln \text{GDP}_{it} + \beta_2 \ln \text{GDP Per Capita}_{it} + \beta_3 \ln \text{Distance}_i \\ &+ \beta_4 \text{ Governance}_{it} + \beta_5 \ln \text{Immigrants}_{it} + \beta_6 \text{ Colony}_i \\ &+ \beta_7 \text{ Border}_i + \beta_8 \text{ Refugees}_i + \eta_t + \varepsilon_{it} \end{aligned} \tag{2.1}$$

where Outward FDI_{it} denotes the outward FDI stock of the Netherlands to host country i at time t, and ε_{it} is an error term. The term η_t denotes time-fixed effects. All continuous variables, except the governance variable are measured in natural logarithms (ln). Colony, border and refugees are dummy variables.

Theory predicts a positive relationship between FDI and the variables GDP, governance, migrant networks, and colony. The expected signs of the GDP per capita, distance, and border variables are ambiguous. We include GDP per capita because, besides the overall market size captured by aggregate GDP, the level of individual purchasing power matters. Root and Ahmed (1979) have pointed out that total GDP may be a poor indicator of market opportunities, especially for developing countries, as it reflects the size of the population rather than aggregate income. Insofar GDP per capita captures market size, the theory on horizontally motivated FDI predicts a positive coefficient sign. If GDP per capita is employed to approximate skilled labor differences between countries (see Di Giovanni, 2005),[18] however, the theory on vertically motivated FDI predicts a negative sign. The

extent of bureaucratic red tape, political stability, and the quality of the legal system but also measures of inequality and quality of living conditions for expatriates, they fail to find a significant effect. Wei (2000) using data on bilateral FDI stocks finds that corruption has a significant negative effect on FDI. Stein and Daude (2002), also using bilateral FDI stocks, find that the significant negative impact of institutional quality is not limited to corruption but rather extends to political instability and violence, government effectiveness, regulatory burden, and the rule of law.

[17]Note that this specification is actually also a unilateral knowledge capital model with the additional variables for governance quality, colonial ties between countries, and countries sharing an international border.

[18]Unfortunately, data on the variable skill difference are hard to come by. Although the International Labor Office publishes annual data on wage costs and wages, the data can be described as incomplete at best. Data for all or most years is missing for almost every emerging market country. In absence of

theories of horizontal and vertical FDI also give conflicting predictions for the distance and border variables. Geographical distance increases trade costs, which encourages horizontal FDI to avoid those costs, but simultaneously discourages vertical FDI because higher costs of shipping goods back to the home country make production abroad less attractive. The expected sign of the border dummy variable is unclear as it could indicate 'likeness' in terms of country characteristics with the source country, suggesting a negative relationship from the perspective of horizontally motivated FDI. Alternatively, it could also indicate closer economic ties and familiarity that make investing relatively easier, thus suggesting a positive relationship. Lastly, we also a include a dummy for countries sending a significant number of refugees to the Netherlands because refugees typically come from countries with serious violent unrest, which in turn likely prevents any FDI into these countries.

Unlike most other gravity model specifications we do not include a dummy variable for a common language in our empirical specification. The reason is that in the context of Dutch data the inclusion of a language dummy variable causes multicollinearity because countries in which Dutch is an official language – Aruba, Belgium, Netherlands Antilles, and Suriname – are either captured in the colony or border dummy.

2.2.2 Censoring

As is common in international trade and investment data, our data set contains a large number of observations (about 40 percent) for which the outward FDI stock is zero. Given that in trade and FDI data typically around 50 percent of the observations are censored (see Silva and Tenreyro, 2006), our censoring rate is at the lower end. Obviously, this poses a problem; the logarithm of zero is undefined. Taking the logarithm of our dependent variable would therefore result in dropping all zero FDI observations.

The literature deals with the censoring problem in different ways. Some authors (see Rose, 2000) simply do drop those observations in which the dependent variable takes a value of zero. However, zero observations do contain important information regarding the allocation of outward FDI and excluding them biases the estimated coefficients downward. It could be the case, for example, that zero observations are more prevalent among countries which send few migrants to the Netherlands. Others (see Eichengreen and Irwin, 1995) deal with the zeroes problem by adding a positive constant (i.e., $a > 0$ and typically $a \leq 1$) to the dependent variable—thus transforming the dependent variable from logarithm of y

any better data, GDP per capita seems to be the closest, though imperfect and not productivity-adjusted proxy for labor costs.

to logarithm of $y + a$—and continue estimating the model with OLS.[19]

Our dependent variable is, however, bounded from below by zero[20] and our data thus are censored. We therefore use a Tobit model. Eaton and Tamura (1994) were the first to introduce a Tobit model to study international trade and FDI data.[21] The Tobit model is defined as follows:

$$y_{it} = \begin{cases} e^{y^*_{it}} & \text{if } y^*_{it} \geq 0 \\ 0 & \text{if } y^*_{it} < 0 \end{cases}, \tag{2.2}$$

where y is the outward FDI stock and y^*_{it} denotes the index variable:

$$\begin{aligned} y^*_{it} &= \beta_0 + \beta_1 \ln \text{GDP}_{it} + \beta_2 \ln \text{GDP Per Capita}_{it} + \beta_3 \ln \text{Distance}_i \\ &+ \beta_4 \text{ Governance}_{it} + \beta_5 \ln \text{Immigrants}_{it} + \beta_6 \text{ Colony}_i \\ &+ \beta_7 \text{ Border}_i + \beta_8 \text{ Refugees}_i + \eta_t + \varepsilon_{it} \end{aligned} \tag{2.3}$$

We will estimate the Tobit model in log-linear form using maximum likelihood (ML) estimation. To capture common time effects, we include a dummy for the two different time periods.[22] For comparison, we will also report the results of our benchmark model using two other estimation techniques; that is, OLS excluding the zero observations and OLS with a transformed dependent variable.

2.2.3 Endogeneity and Instrumental Variable Issues

A potential concern regarding the estimation of our model specification is endogeneity. Javorcik et al. (2011) argue that our variable of interest, immigration, might be endogenous. They identify two possible channels for a reverse causal relationship between immigration

[19] By adding a positive constant, the logarithm of the zero observations can be taken and for large y the logarithm of $y + a$ is approximately equal to logarithm of y. Note that this approach might be sensitive to the choice of a.

[20] Technically speaking, that is not exactly true. FDI stocks can take on negative values under certain circumstances, for example, in the case of disinvestment or continuous losses in the affiliate leading to negative reserves. See Section 2.3 for more details on the characteristics of FDI flows in our sample.

[21] Eaton and Tamura's (1994) model assumes that FDI is only strictly positive when the right-hand side of the model reaches a minimum threshold level A, where A is to be estimated. Another way in which the Tobit model has been employed and the zeroes retained is to simply take the logarithm of the non-zero observations and assign zero values to the censored observations (see Stein and Daude, 2007).

[22] Country random effects are controlled for in the robust analysis. Panel fixed effects Tobit regressions based on ML estimation are a problematic option when the number of cross-sectional units is large and the panel's time dimension is small (i.e., the incidental parameter problem). Furthermore, all time invariant variables would drop from the panel.

and FDI: (i) lower migration incentives because FDI may generate better employment opportunities in the home countries of the migrants and contribute to economic growth and (ii) higher migration rates due to expatriate employment opportunities in the FDI source country that facilitate migration.

While those channels are certainly plausible, it not clear that they are actually at work. The literature on the impact of FDI on economic growth, for example, is far from conclusive; nevertheless the positive impact assumed in the argument appears to have acquired the status of a stylized fact (Lensink and Morrissey, 2006). Moreover, we are also skeptical as to whether FDI from one country alone actually affects the incentives to migrate. After all, the Netherlands is just one of many countries to invest abroad and thus to potentially contribute to overall economic growth and employment opportunities. It also seems to be a bit of stretch to assume that expatriate working opportunities significantly contribute to migration, especially considering that there are likely very few expatriate working opportunities in the first place. Therefore, we believe endogeneity is less of a concern. Nevertheless, as a robustness check we instrument our immigrant variable.

We follow the literature in our choice of instruments and use past immigration first instrument for current immigration. Historical networks have been shown to play an important role in current migration flows both through information exchange and family reunification programs (Boyd, 1989). In the Netherlands family migration is the main source of immigrants and accounts for about 40 percent of all immigrants (Focus Migration, 2007).

Another source of endogeneity in the model might be the governance variable. Because theory suggests that migrant networks may be especially important in a weak governance environment, we are also concerned about the potential endogeneity between governance and FDI. Benassy-Quere et al. (2007) argue that the causality between FDI and governance quality could run both ways. On the one hand, better formal institutions make a country more attractive to foreign investors and thus may lead to higher FDI levels. On the other hand, higher FDI levels could put pressure on governments to improve their institutional framework. Again, because the Netherlands is just one of many countries to invest abroad and thus to potentially contribute to governance improvements we do not believe this to be an issue of concern. However, as a robustness check we also test for this endogeneity using ethnic fractionalization as instrument. The literature on the determinants of institutional quality suggests that ethnic fractionalization matters and is inversely related to it (see La Porta et al., 1999).

2.3 Data

Several data sources are used in constructing our sample. Data on the Dutch outward FDI stock come from the Dutch Central Bank. Because annual flows of FDI are a poor proxy of multinational activities by firms (Levy-Yeyati et al., 2003), we use stocks of outward FDI. It is possible, for example, that FDI flows to a recipient country in a given year are zero even though Dutch firms might have a significant presence and activity in this country. Furthermore, flows may substantially change from year to year, owing to valuation changes.

Data on migrants come from Statistics Netherlands. It defines immigrants as people living in the Netherlands who have at least one non-Dutch parent and bases its data on the registered population of the Netherlands.[23] Following Javorcik et al. (2011) and Kugler and Rapoport (2007), we approximate migrant networks by the total number of immigrants.[24] Statistics Netherlands also provides a generational breakdown of immigrations by country, distinguishing between first and second generation immigrants. It classifies as first generation those immigrants who are born abroad and as second generation those born in the Netherlands. Within the category of second generation immigrants further distinction is made between those with one parent born abroad and those with both parents born abroad. In addition to the total number of immigrants we also use the total number immigrants by generation and both the total number of immigrants and the share of immigrants by generation in alternate specifications. In our instrumental variable estimation we use data on immigrants in 1996, the first year for which a country-by-country breakdown is available, as instrument for the cross-sectional sample.

The data set covers 180 recipient countries for the 1997–2006 period. The year 1996 is the first for which a country-by-country breakdown of immigrants in the Netherlands is

[23]Note that different countries employ different definitions of immigrants. In the United States, for example, only foreign-born individuals are classified as immigrants.

[24]Ideally, we would like to not only measure the existence and size of the network but rather its strength, that is, the extent of contact that specific immigrant groups have with their country of origin and the level of entrepreneurial activity associated with it. Unfortunately, the data requirements for this kind of measure are prohibitively high. In the context of ethnic Chinese networks and bilateral trade data, the ethnic network has been proxied by the probability that if an individual is randomly chosen from each country, both are Chinese (i.e., the product of the ethnic Chinese population shares for each country pair; see Rauch and Trindade, 2002) or the number of potential international connections between the ethnic Chinese populations in the two countries (i.e., the product of the two respective populations; Rauch and Trindade, 2002; Tong, 2005). Gao (2003), using unilateral data, approximates the size of the ethnic Chinese network by the population share of the Chinese in the source country of FDI into China. Because we do not have bilateral data but only one FDI source country and because by definition of our more general immigrant network everyone in the FDI host country belongs to the network, our focus on the number of migrants in the Netherlands captures the size of the migrant networks closely.

available and 2006 is the most recent year for which FDI data are available. Our benchmark sample is a panel in which we divide the sample into two waves of equal length, 1997–2001 and 2002–2006, and use the averages of those two periods as dependent variables. We average the data instead of using the full panel for reasons similar to why we choose FDI stocks over FDI flows, namely to mitigate any volatility in the FDI data from year to year. Even though we believe that the variance in our sample lies in the cross-section of our data because most of our exogenous variables are relatively time-invariant and we look at FDI stocks, we use the panel to exploit the additional information available in our data that would be lost if we only focused on the cross-section. Table 2.1 provides summary statistics.

The two wave panel approach is also of value because we are concerned about multicollinearity in the data which may lead to unreliable estimates with high standard errors. A look at the correlation matrix for the Tobit sample in Table 2.2 indeed shows high correlations for a number of explanatory variables: GDP is highly correlated with immigrants and GDP per capita is highly correlated with governance. Furthermore, GDP shows a strong association with FDI. A remedy to the problem of multicollinearity, which is essentially one of insufficient information in the sample, is to extend the sample. Using the panel approach, we are able to double the sample to 360 observation compared to 180 observations in the cross-section. As a robustness check, we also report the results for a cross-section using the averages over the 2002-2006 period only.

Table 2.3 lists the Top 20 countries of origin for immigrants in the Netherlands and the Top 20 host countries of the Dutch FDI stock for the period 2002–2006. Immigrants constitute about 18 percent of the total population in the Netherlands and about 80 percent of them come from just 20 countries, including four countries which are former Dutch colonies (Indonesia, Suriname, Netherlands Antilles, and Aruba) and two countries which we classify as refugee countries (Iraq and Afghanistan). Table 2.3 also lists the Top 20 destination countries for the outward FDI stock of the Netherlands. Almost 90 percent of the outward FDI stock is concentrated in 20 countries. Nine countries appear in both the immigrant column and the outward FDI stock column, suggesting that FDI and immigration may indeed be complements.

Data on real GDP and real GDP per capita come from the World Bank's World Development Indicators (WDI). Data on physical distance, land borders, and colonies are taken from Centre D'Etudes Prospectives et D'Informations Internationales (CEPII). Governance data come from Kaufman et al. (2008) and the governance variable is constructed

by taking the average of six individual governance indicators (i.e., voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption). Indicators range from -2.5 to 2.5 with more positive values indicating better governance. We identify a country as a refugee country if for any given year during the sample period the country sends at least 200 refugees to the Netherlands as recorded by the UNHCR Statistical Online Population Database. Data on fractionalization come from Alesina et al. (2003). Fractionalization measures ethnic heterogeneity and varies between 0 and 1 with higher values indicating more fractionalized or ethnically heterogeneous countries. See Table 2.A in the Appendix for detailed variable definitions and data sources.

2.4 Empirical Results

We begin our analysis with the presentation of our benchmark panel result. Next, we repeat our analysis for the cross-section sample before reporting the results from the instrumental variable approach. We then present the results by generational composition of the immigrant stock. Finally, we test whether the results of our benchmark Tobit panel results are robust to changes in sample and whether immigrant networks promote outward FDI to a greater extent into countries with relative weaker institutions.

2.4.1 Benchmark Panel Results

Our benchmark panel results are reported in Table 2.4. We start with reporting the OLS estimates of our specification in columns (1)–(4) for both dropped and retained zeroes before turning to the Tobit estimates, our preferred estimates, in columns (5)–(6). For each estimation we report first the standard gravity model and then add the immigrant variable.

Our results indicate that there is a positive and significant relationship between the number of immigrants and the Dutch FDI stock in their country of origin in the specification that do not drop the zero observations (columns (4) and (6)). In the OLS specification with retained zeroes the coefficient estimate of the immigrant variable is 0.64 suggesting a 1 percent increase in the stock of immigrants leads to a 0.64 percent increase in FDI. In the Tobit model the estimated coefficient suggests that a 1 percent increase in the stock

of immigrants leads to a 1.08 percent increase in FDI.[25] [26] The size of our estimates is comparable to the findings of Javorcik et al. (2011) who, depending on their specification, find that a 1 percent increase in the immigrant stock is associated with a 0.35-0.67 percent increase in the FDI stock using an OLS specification.

The OLS results suggest that both models explain between 60–70 percent of the total variance in FDI, which is in line with other OLS estimates of gravity models for FDI in the literature. The standard variables GDP, distance, governance, colony, and border are significant in the specification with dropped zeroes. The distance variable and border dummy variable are no longer significant once the zero observations are included. Governance loses its significance in the Tobit specifications.

2.4.2 Cross-Section Results

We noted above that we believe that the variation of the sample comes from the cross-section of the sample. Table 2.5 therefore repeats the analysis in Table 2.4 for just the cross-section of the 2002–2006 average. The results are almost identical to the panel results reported in Table 2.4 with slight changes in the coefficient point estimates. The estimates also confirm our suspicion regarding multicollinearity in the data. Compared to the panel regressions the standard errors increase and as result the significance of the immigrant variables decreases from the 5 percent level of significance to the 10 percent level of significance.

[25] Note that the estimated coefficients in a Tobit model have a different interpretation than in an OLS model. The coefficients represent an upper bound on the marginal effect because the natural logarithm of the expected value of y_i given a change in $\mathbf{x_i}$ (i.e., the vector of explanatory variables) depends on the probability of having a positive outcome:

$$\frac{\partial \ln \mathrm{E}[y_i|\mathbf{x}_i]}{\partial \mathbf{x}_i} = \beta \; \Phi\left(\frac{\mathbf{x_i'}\boldsymbol{\beta}}{\sigma}\right),$$

where $0 < \Phi(\cdot) < 1$ denotes the probability and $\boldsymbol{\beta}$ is a vector of coefficients. This equation says that with censoring at zero, as in our case, the coefficient estimate is multiplied by the probability of having a positive outcome. If the probability of having a positive outcome is one for a particular country, then the marginal effect is simply β. The marginal effects we calculated (but do not report here) are as expected a bit smaller than the coefficient estimates reported but have the same relative ordering.

[26] Because Tobit ML estimates generally do not remain consistent in the presence of non-normality and heteroskedasticity of the errors, we check whether the errors are indeed normal and homoskedastic. The conditional moment test of Pagan and Vella (1989) against the null hypothesis of normal errors has a p-value of 0.1330 and 0.0608, respectively, for the model excluding and including the immigrant variable. Thus, we cannot reject the normality of the errors at the 10 percent and 5 percent significance level or higher, respectively. We report robust standard errors.

2.4.3 Instrumental Variable Results

We address the potential endogeneity of the immigration and governance variables by using the instrumental variable approach for the Tobit model. Because the earliest data on migration broken down by nationality is only available in 1996 we use our cross-section sample as basis for the instrumental variable approach. There are two ways to estimate Tobit models with instrumented variables. The two-step estimator based on Newey's minimum χ^2 estimator estimates the first stage as an OLS regression with all the explanatory variables in the original model plus the instrument on the variable to be instrumented. The ML estimator, on the other hand, simultaneously estimates the first and the second stage. The results for both estimators are reported in Table 2.6 because while the ML estimator is more efficient, unlike the two-step estimator, it does not allow for the Wald exogeneity test.

We start by instrumenting the immigrant variable. The results from the first stage (in the interest of space restricted to the coefficient estimates of the instruments) suggest that the number of immigrants in 1996 is a good instrument for the average number of immigrants during the 2002-2006 period. We find a significant and positive relationship between the immigrant variable and the FDI stock. Compared to the regular cross-section Tobit results, the IV results are larger in magnitude. This suggests that the Tobit results may be biased downwards. However, we remain skeptical as to whether endogeneity is indeed a concern. Combined with the fact that the data unfortunately only allows us to lag immigration by six years, the panel regression results reported above thus remain our preferred specification.

We also instrument the governance variable with the fractionalization variable. The results are reported in the last two columns of Table 2.5. Our first-stage regressions indicate that ethnic fractionalization is insignificant and therefore not a valid instrument for our sample (second stage results are therefore not reported). To test the null hypothesis of exogenous governance, we conduct a Wald exogeneity test. The p-values indicate that the null hypothesis cannot be rejected at the 10 percent significance level. This suggest that no endogeneity exists and therefore no IV estimation is necessary, confirming our doubts concerning the endogeneity of the governance variable.

2.4.4 Generational Composition of Immigrants

Our dataset allows us to identify the generational composition of immigrants by country. We use this information to test whether the relationship between migrants and FDI varies by generational background. In particular, using our preferred Tobit panel specification we replace the number of immigrants first by the number of immigrants for each generation (Table 2.7) and then use both the total number of immigrants and the share of a given immigrant generation (Table 2.8).[27] Since the literature predicts that migrant networks can help overcome information barriers between two countries and may so promote FDI we expect that the effect is strongest for second generation immigrants and in particular those with one parent born abroad since they are most likely to have a strong cultural bond to both their country of origin and the Netherlands.

The results suggests that the presence of immigrants of all backgrounds is positively and significantly related to the Dutch FDI stock in their country of origin. The coefficient estimate is larger and more statistically significant for second generation immigrants compared to first generation immigrants. The results suggest that a 1 percent increase in all second generation immigrants results in a 1.27 percent increase in the Dutch FDI stock in their country of origin.[28] This compares to the coefficient estimates of 1.08 for all immigrants in Table 2.4. Within the group of second generation immigrants the coefficient estimates is larger and more statistically significant for those with one parent born abroad (1.68) compared to those with both parents born abroad (0.78). These results are in line with the predictions from the literature. Second generation immigrants and particularly those with one parent born abroad constitute the group of immigrants that is most likely to have a strong connection to both their home country and the Netherlands through their parents and is thus most likely to be able to facilitate the promotion of FDI.

The results are similar if instead of the number of immigrants by generation we use the total number of immigrants and control additionally for the share of a given generation as percentage of total migration. Again, the effect is largest and most statistically significant for second generation immigrants and in particular those with one parent born abroad. Holding the total number of immigrants constant, a 1 percent increase in the share of second generation immigrants (second generation immigrants with one parent born abroad) raises the Dutch FDI stock in their country of origin by an additional 0.14 (0.11) percent.

[27] The results are similar for the other model specifications reported in Table 2.4

[28] Again note that those coefficient estimates are upper bounds on the effect (see footnote 25 above).

2.4.5 Sample Robustness Tests

In Table 2.9 we test whether our key result of the panel Tobit analysis is robust to changes in our sample. In the first column, we restrict our sample to only those 33 countries that receive 95 percent of the Dutch FDI outward stock as we are most interested in knowing whether our key result holds once we exclude all those countries that do not receive a significant portion of Dutch FDI. We label this sample *Major FDI Recipients*. In column (2), we restrict our sample to *Non-Small Countries*, that is we drop those countries from our sample that have populations of fewer than one million inhabitants as they might not be relevant recipient countries. The third column restricts the sample to non-EU countries. Member countries of the EU have a special relationship with the Netherlands due to the EU single market which ensures the free movement of goods, services, capital and persons and thus may affect both migration and FDI flows.

Our finding that immigrants significantly affect outward FDI is robust to all three changes in sample.[29] However, the coefficient estimate for the *Major FDI Recipients* sample is only a fraction ot the *Non-small Countries* and *Non-EU Countries* sample: while a 1 percent increase in the number of immigrants increases the FDI stock by only 0.17 percent for major FDI recipients, a 1 percent increase in immigrants in the *Non-small Countries* sample increases the FDI stock by 1.44 percent or by 1.31 percent in the *Non-EU Countries* sample.[30] Given that the countries in the *Major FDI Recipients* sample are almost exclusively countries with relatively good formal institutions, finding that migrant networks have less of an effect in that sample is in line with our expectations.

In the remaining columns of Table 2.9 we test whether immigrant networks do indeed promote outward FDI to a greater extent into countries with relatively weak institutions as theory suggests. To do so, we use two approaches. First, we add an interaction effect between immigrants and governance. The interaction effect enters negatively and significantly at the 1 percent level suggesting that immigrants have a larger effect on the outward FDI stock the lower the quality of governance.

Second, we divide countries into three categories of governance quality: high, average, and low. Given that our governance variable varies from -2.5 to 2.5 and the mean value

[29]The results are also robust to excluding the Russian Federation and the United States, two major countries that both fall into the Top 20 immigrant source and outward FDI stock host countries for the Netherlands (see Table 2.3), in addition to EU member countries from the sample.

[30]Again note that those coefficient estimates are upper bounds on the effect (see footnote 25 above). Note also that the sub-samples differ in their percentage of censored observations, which affects the calculation of the marginal effects.

for that variable in our sample is about zero, we put a country into the high governance category if its governance value is greater than 0.5, the low governance category if smaller than -0.5, and the average governance category if otherwise. Since the standard deviation of the governance variable is about 0.9 in our sample about a third of the sample falls into each of the three governance categories. Our results show that the coefficient of the immigrant variable is decreasing as we move from low to high governance. However, the coefficient estimates are only significant in the average and high governance samples. A 1 percent increase in the number of immigrants increases FDI by 1.46 percent in countries with average governance quality while it only increases FDI by 0.94 percent in countries with high governance.[31]

The results of both approaches suggest that immigrant networks indeed play a more important role in promoting FDI if the institutional quality in the destination country is relatively weak. The insignificance of the immigrant variable in the low governance sample is a bit puzzling. Theory suggests that migrant networks might be especially important in promoting international trade and investment in environments with weak formal governance structure. A possible explanation for this finding is that there might be a threshold effect at work: only when investment takes place in an environment where a minimum standard of governance is met, do immigrant networks make a difference.

2.5 Conclusion

This chapter studies the effect of immigrant networks on FDI. It extends the evidence that co-ethnic social networks promote international investment to more general ethnic networks, namely migrant networks. Using a gravity model and panel data on 180 countries, we find that immigrants and FDI flows are complements in the context of Dutch data. In our preferred Tobit specification, a 1 percent increase in the number of immigrants in the Netherlands increases the Dutch FDI stock in their country of origin by 1.08 percent. The effect is strongest for second generation immigrants with one parent born abroad. A 1 percent increase in the number of second generation immigrants with one parent born abroad increases the Dutch FDI stock by 1.68 percent. Furthermore, keeping the total number of immigrants constant, a 1 percent increase in the share of second generation immigrants with one parent born abroad raises the Dutch FDI stock by an additional 0.1 percent. The

[31] Again note that those coefficient estimates are upper bounds on the effect (see footnote 25 above). Note also that the sub-samples differ in their percentage of censored observations, which affects the calculation of the marginal effects.

sign and significance of the immigrant variable is robust to a range of robustness checks though the size of the coefficient does vary. Our robustness checks also suggest that countries may have to reach a certain threshold level of governance quality for immigrants to play a significant role in promoting FDI.

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Table 2.1: Summary Statistics

	# obs	Mean	Std. Dev.	Min	Max
Tobit Panel Sample (including zeroes)					
FDI (ln)	360	11.501	9.828	0.000	25.043
Immigrants (ln)	360	7.073	2.509	0.000	12.916
All 1st Generation Immigrants (ln)	358	6.644	2.452	0.000	12.167
All 2nd Generation Immigrants (ln)	358	5.895	2.608	0.000	12.595
2nd Generation: One Parent Born Abroad (ln)	358	5.394	2.514	0.000	12.518
2nd Generation: Two Parents Born Abroad (ln)	358	4.590	2.695	0.000	11.826
Share of 1st Generation Immigrants	356	66.137	14.247	0.000	97.779
Share of 2nd Generation Immigrants	356	33.863	14.247	2.221	100.000
Share of 2nd Generation: One Parent Born Abroad Immigrants	356	24.276	16.223	0.379	100.000
Share of 2nd Generation: Two Parents Born Abroad Immigrants	356	9.587	7.505	0.000	41.052
GDP (ln)	360	23.103	2.399	17.657	29.996
GDP per capita (ln)	360	7.654	1.647	4.458	11.530
Distance (ln)	360	8.417	0.894	5.153	9.845
Governance	360	-0.014	0.904	-2.122	1.925
Colony Dummy	360	0.033	0.180	0.000	1.000
Border Dummy	360	0.011	0.105	0.000	1.000
Refugee Dummy	360	0.067	0.250	0.000	1.000
OLS Panel Sample (excluding zeroes)					
FDI (ln)	211	19.622	2.240	14.509	25.043
Immigrants (ln)	211	8.165	2.059	1.825	12.916
GDP (ln)	211	24.465	1.931	19.915	29.996
GDP per capita (ln)	211	8.285	1.545	4.458	11.530
Distance (ln)	211	8.249	1.019	5.153	9.845
Governance	211	0.278	0.913	-2.064	1.925
Colony Dummy	211	0.057	0.232	0.000	1.000
Border Dummy	211	0.019	0.137	0.000	1.000
Refugee Dummy	211	0.038	0.191	0.000	1.000
Tobit Cross-Section Sample (including zeroes)					
FDI (ln)	180	11.762	9.903	0.000	25.043
Immigrants (ln)	180	7.257	2.485	0.000	12.891
GDP (ln)	180	23.199	2.401	17.715	29.996
GDP per capita (ln)	180	7.717	1.649	4.458	11.530
Distance (ln)	180	8.417	0.896	5.153	9.845
Governance	180	-0.013	0.909	-1.808	1.925
Colony Dummy	180	0.033	0.180	0.000	1.000
Border Dummy	180	0.011	0.105	0.000	1.000
Refugee Dummy	180	0.061	0.240	0.000	1.000
Instrumental Variables					
Immigrants in 1996 (ln)	180	6.635	2.565	0.000	12.928
Fractionalization	180	0.426	0.255	0.000	0.930

Table 2.2: Correlation Matrix of Cross-Section Sample

		1	2	3	4	5	6	7	8	9	10	11
1	FDI (ln)	1.000										
2	Immigrants (ln)	0.561***	1.000									
3	GDP (ln)	0.762***	0.697***	1.000								
4	GDP per capita (ln)	0.524***	0.123	0.501***	1.000							
5	Distance (ln)	-0.294***	-0.353***	-0.352***	-0.375***	1.000						
6	Governance	0.435***	0.053	0.341***	0.835***	-0.350***	1.000					
7	Colony Dummy	0.158**	0.261***	0.007	0.136*	0.020	0.116	1.000				
8	Border Dummy	0.136*	0.214***	0.180**	0.152**	-0.316***	0.172**	-0.020	1.000			
9	Refugee Dummy	-0.138*	0.127*	-0.070	-0.207***	-0.019	-0.297***	-0.047	-0.027	1.000		
10	Immigrants in 1996 (ln)	0.614***	0.979***	0.716***	0.214***	-0.358***	0.147**	0.279***	0.234***	0.025		
11	Fractionalization	-0.140*	0.035	-0.163**	-0.436***	0.134*	-0.411***	0.121	-0.027	0.122	-0.027	1.000

Note: $* \ p < 0.1$, $** \ p < 0.05$, $*** \ p < 0.01$

Table 2.3: Top 20 Immigrant Source and Outward FDI Stock Host Countries for the Netherlands, 2002 to 2006 Average

	Immigrants			Outward FDI Stock	
	Number	Cumulative %		in 2002 constant US$ (Millions)	Cumulative %
Indonesia*	396,811	13.02	United States	75,200	16.56
Germany	388,530	25.78	United Kingdom	65,450	30.97
Turkey	352,589	37.35	Germany	39,390	39.65
Suriname*	325,990	48.05	Belgium	39,040	48.25
Morocco	309,038	58.19	Switzerland	32,780	55.47
Belgium	112,805	61.90	France	30,410	62.16
Netherlands Antilles*	84,108	64.66	Luxembourg*	20,530	66.68
United Kingdom	75,909	67.15	Spain	19,010	70.87
Aruba*	45,074	68.63	Italy	13,190	73.78
Iraq**	42,928	70.04	Ireland	11,740	76.36
China	41,682	71.41	Canada	9,259	78.40
Poland	39,727	72.71	Brazil	6,687	79.87
Italy	35,827	73.89	Poland	6,102	81.22
Afghanistan**	35,493	75.05	Sweden	5,987	82.54
France	32,907	76.13	Russian Federation	5,411	83.73
Spain	31,183	77.15	Australia	5,256	84.88
United States	30,246	78.15	Singapore	5,121	86.01
Serbia and Montenegro	29,884	79.13	Nigeria	4,151	86.93
Iran	28,275	80.06	Austria	3,861	87.78
Russian Federation	21,228	80.75	Korea, Rep.	3,846	88.62
Total	3,046,599	100.00	Total	454,077	100

Sources: Authors' calculations based on data from Statistics Netherlands, Dutch Central Bank, and the *World Development Indicators*.

Notes: $*$ former colony and $**$ refugee country.

Table 2.4: Estimation Results for the Benchmark Model

	OLS				Tobit	
	ln (FDI)		ln (FDI + 1)			
	(1)	(2)	(3)	(4)	(5)	(6)
Immigrants (ln)		0.126		0.643**		1.081**
		(0.101)		(0.306)		(0.507)
GDP (ln)	0.843***	0.748***	2.847***	2.303***	4.198***	3.288***
	(0.076)	(0.117)	(0.181)	(0.342)	(0.379)	(0.570)
GDP per capita (ln)	-0.153	-0.069	-0.032	0.359	0.158	0.799
	(0.147)	(0.173)	(0.592)	(0.614)	(0.982)	(1.015)
Distance (ln)	-0.303**	-0.254*	0.162	0.471	0.005	0.488
	(0.124)	(0.135)	(0.476)	(0.477)	(0.751)	(0.761)
Governance	0.563**	0.526**	1.881*	1.765*	1.745	1.551
	(0.242)	(0.252)	(1.076)	(1.060)	(1.714)	(1.690)
Colony Dummy	1.748**	1.222	7.489***	4.622**	10.604***	5.810*
	(0.718)	(0.836)	(2.039)	(2.095)	(3.220)	(3.183)
Border Dummy	1.162*	0.887	-1.283	-2.481	-4.129	-6.218
	(0.695)	(0.708)	(2.633)	(2.694)	(3.721)	(3.808)
Refugee Dummy	-0.295	-0.396	-2.259	-3.177	-3.990	-5.422
	(0.474)	(0.524)	(1.996)	(2.069)	(3.768)	(3.823)
Dummy for 1997-2001 Period	-0.208**	-0.177*	0.051	0.242	0.156	0.455
	(0.098)	(0.104)	(0.285)	(0.299)	(0.436)	(0.459)
Constant	2.594	2.819	-55.474***	-52.982***	-90.266***	-85.725***
	(2.454)	(2.405)	(7.058)	(7.254)	(12.715)	(12.762)
Adjusted R2	0.704	0.708	0.612	0.619		
p-value F test	0.000	0.000	0.000	0.000		
Log-Likelihood	-336.53	-334.47	-1,158.58	-1,154.79	-863.11	-859.29
p-value LR test					0.000	0.000
Number of observations	211	211	360	360	360	360
% censored observations					41.39	41.39

Notes: The dependent variable in columns (1)–(2) is the natural logarithm of the average stock of FDI, where the zero observations are dropped. Columns (3)–(4) retain the zeroes by adding unity and then taking the logarithm. Columns (5)–(6) also take the natural logarithm of the average FDI stock, where the zero FDI values are taken into account as censored observations. The observations form a two-wave panel which averages over 1997–2001 and 2002–2006. Robust standard errors are reported in parentheses. ***, **, * denote significance at the 1, 5 or 10 percent level, respectively.

Table 2.5: Estimation Results for the Cross-Section Model, 2002 to 2006 Average

	OLS				Tobit	
	ln (FDI)		ln (FDI + 1)			
	(1)	(2)	(3)	(4)	(5)	(6)
Immigrants (ln)		0.087		0.528*		0.900*
		(0.110)		(0.327)		(0.524)
GDP (ln)	0.867***	0.800***	2.884***	2.434***	4.193***	3.431***
	(0.081)	(0.126)	(0.193)	(0.369)	(0.392)	(0.607)
GDP per capita (ln)	-0.205	-0.139	0.140	0.492	0.437	1.026
	(0.151)	(0.186)	(0.633)	(0.670)	(1.015)	(1.065)
Distance (ln)	-0.373***	-0.336**	0.090	0.364	-0.094	0.340
	(0.140)	(0.158)	(0.514)	(0.506)	(0.786)	(0.775)
Governance	0.691***	0.663**	1.727	1.635	1.453	1.296
	(0.246)	(0.258)	(1.093)	(1.088)	(1.679)	(1.671)
Colony Dummy	1.579**	1.216	7.116***	4.793**	10.119***	6.186*
	(0.720)	(0.853)	(1.952)	(2.141)	(3.078)	(3.208)
Border Dummy	0.944	0.770	-1.589	-2.486	-4.389	-5.992
	(0.623)	(0.620)	(2.526)	(2.610)	(3.543)	(3.665)
Refugee Dummy	-0.546	-0.596	-1.309	-1.993	-1.961	-3.002
	(0.832)	(0.883)	(2.343)	(2.525)	(4.179)	(4.412)
Constant	3.004	3.102	-57.097***	-55.383***	-91.516***	-88.357***
	(2.808)	(2.767)	(7.444)	(7.663)	(12.950)	(13.109)
Adjusted R2	0.702	0.701	0.619	0.623		
p-value F test	0.000	0.000	0.000	0.000		
Log-Likelihood	-172.71	-172.24	-577.10	-575.81	-433.77	-432.41
p-value LR test					0.000	0.000
Number of observations	107	107	180	180	180	180
% censored observations					40.56	40.56

Notes: The dependent variable in columns (1)–(2) is the natural logarithm of the average stock of FDI, where the zero observations are dropped. Columns (3)–(4) retain the zeroes by adding unity and then taking the logarithm. Columns (5)–(6) also take the natural logarithm of the average FDI stock, where the zero FDI values are taken into account as censored observations. The observations form a two-wave panel which averages over 1997–2001 and 2002–2006. Robust standard errors are reported in parentheses. ***, **, * denote significance at the 1, 5 or 10 percent level, respectively.

Table 2.6: Estimation Results for the IV Model

	(1)	(2)	(3)	(4)
	Two-Step	**ML**	**Two-Step**	**ML**
Stage I				
Immigrants in 1996 (ln)	0.887***	0.887***		
	(0.020)	(0.019)		
Fractionalization			-0.179	-0.179
			(0.162)	(0.158)
Stage II				
Immigrants (ln)	1.206**	1.206**		
	(0.564)	(0.564)		
GDP (ln)	3.089***	3.089***		
	(0.617)	(0.616)		
GDP per capita (ln)	1.425	1.425		
	(1.010)	(1.009)		
Distance (ln)	0.610	0.610		
	(0.958)	(0.957)		
Governance	1.057	1.057		
	(1.557)	(1.556)		
Colony Dummy	4.640	4.640		
	(4.529)	(4.525)		
Border Dummy	-6.142	-6.142		
	(6.875)	(6.867)		
Refugee Dummy	-4.037	-4.037		
	(3.547)	(3.544)		
Constant	-87.874***	-87.874***		
	(13.446)	(13.433)		
Log-Likelihood		-511.90		
Number of observations	180	180	180	180

Notes: The dependent variable is the natural logarithm of the average stock of FDI for 2002–2006, where the zero observations are taken into account as censored observations. Robust standard errors are reported in parentheses. ***, **, * denote significance at the 1, 5 or 10 percent level, respectively. Columns (1)-(2) instrument the immigrant variable while column (3)-(4) instruments the governance variable. Because the instrument for governance is invalid no second stage results are reported.

Table 2.7: Estimation Results for Tobit Panel: Immigrants by Generation

	(1)	(2)	(3)	(4)
All 1st Generation Immigrants (ln)	0.891*			
	(0.515)			
All 2nd Generation Immigrants (ln)		1.265***		
		(0.469)		
2nd Generation: One Parent Born Abroad (ln)			1.681***	
			(0.528)	
2nd Generation: Two Parents Born Abroad (ln)				0.775**
				(0.387)
GDP (ln)	3.461***	3.080***	2.760***	3.536***
	(0.567)	(0.545)	(0.558)	(0.500)
GDP per capita (ln)	0.620	0.941	1.167	0.574
	(1.018)	(1.002)	(0.992)	(1.007)
Distance (ln)	0.372	0.535	0.712	0.361
	(0.759)	(0.763)	(0.789)	(0.736)
Governance	1.659	1.268	0.873	1.743
	(1.689)	(1.683)	(1.682)	(1.681)
Colony Dummy	6.852**	4.498	2.648	6.752**
	(3.201)	(3.131)	(3.320)	(3.029)
Border Dummy	-5.277	-7.302*	-8.747**	-5.419
	(3.715)	(3.801)	(3.882)	(3.757)
Refugee Dummy	-5.375	-5.317	-4.864	-5.213
	(3.845)	(3.722)	(3.580)	(3.782)
Dummy for 1997-2002 Period	0.364	0.544	0.597	0.460
	(0.456)	(0.457)	(0.445)	(0.472)
Constant	-85.585***	-82.136***	-79.555***	-84.547***
	(12.861)	(12.661)	(12.679)	(12.792)
Log-Likelihood	-859.41	-855.87	-852.72	-858.82
p-value LR test	0.000	0.000	0.000	0.000
Number of observations	358	358	358	358
% censored observations	41.06	41.06	41.06	41.06

Notes: The dependent variable is the natural logarithm of the average stock of FDI (for 1997–2001 and 2002–2006), where the zero observations are taken into account as censored observations. Robust standard errors are reported in parentheses. ***, **, * denote significance at the 1, 5 or 10 percent level, respectively.

Table 2.8: Estimation Results for Tobit Panel: Immigrants by Generational Shares

	(1)	**(2)**	**(3)**	**(4)**
All Immigrants (ln)	0.881*	0.881*	1.235**	0.856
	(0.512)	(0.512)	(0.537)	(0.652)
Share of 1st Generation Immigrants	-0.140**			
	(0.058)			
Share of 2nd Generation Immigrants		0.140**		
		(0.058)		
Share of 2nd Generation:			0.108**	
One Parent Born Abroad Immigrants			(0.050)	
Share of 2nd Generation:				0.033
Both Parents Born Abroad Immigrants				(0.100)
GDP (ln)	3.254***	3.254***	3.066***	3.390***
	(0.555)	(0.555)	(0.565)	(0.615)
GDP per capita (ln)	0.918	0.918	0.981	0.762
	(0.993)	(0.993)	(0.998)	(1.025)
Distance (ln)	0.180	0.180	0.349	0.293
	(0.761)	(0.761)	(0.779)	(0.770)
Governance	0.624	0.624	0.639	1.504
	(1.710)	(1.710)	(1.734)	(1.724)
Colony Dummy	4.803	4.803	4.357	6.448*
	(3.436)	(3.436)	(3.448)	(3.316)
Border Dummy	-10.178**	-10.178**	-10.271**	-5.786
	(4.001)	(4.001)	(4.189)	(3.862)
Refugee Dummy	-4.162	-4.162	-4.860	-5.295
	(3.759)	(3.759)	(3.758)	(3.870)
Dummy for 1997-2002 Period	0.520	0.520	0.444	0.418
	(0.457)	(0.457)	(0.453)	(0.460)
Constant	-72.433***	-86.467***	-84.310***	-84.777***
	(12.612)	(12.374)	(12.417)	(12.867)
Log-Likelihood	-852.97	-852.97	-854.32	-857.66
p-value LR test	0.000	0.000	0.000	0.000
Number of observations	356	356	356	356
% censored observations	40.73	40.73	40.73	40.73

Notes: The dependent variable is the natural logarithm of the average stock of FDI (for 1997–2001 and 2002–2006), where the zero observations are taken into account as censored observations. Robust standard errors are reported in parentheses. ***, **, * denote significance at the 1, 5 or 10 percent level, respectively.

Table 2.9: Estimation Results for Tobit Panel: Robustness Analysis

	Major FDI Recipients	Non-Small Countries	Non-EU Countries	Governance Interaction	Governance Quality		
					Low Gov	Ave Gov	High Gov
Immigrants (ln)	0.166**	1.440**	1.310**	1.227**	2.473	1.460**	0.938*
	(0.074)	(0.679)	(0.611)	(0.509)	(2.297)	(0.651)	(0.526)
x Governance				-1.073***			
				(0.415)			
GDP (ln)	0.448***	2.243***	3.548***	3.451***	5.380**	3.990***	1.872***
	(0.159)	(0.772)	(0.659)	(0.582)	(2.458)	(0.738)	(0.715)
GDP per capita (ln)	-0.275	1.435	0.921	0.392	-0.767	1.173	-0.046
	(0.242)	(1.235)	(1.112)	(1.028)	(2.495)	(1.310)	(1.672)
Distance (ln)	-0.335***	1.608*	0.579	0.464	9.037**	0.148	-0.741
	(0.090)	(0.833)	(1.131)	(0.662)	(3.576)	(1.636)	(0.482)
Governance	0.537**	1.509	1.459	10.361***	4.103	5.023	0.378
	(0.261)	(1.804)	(1.955)	(4.009)	(6.452)	(4.612)	(2.067)
Colony Dummy	1.986***	-2.057	4.612	5.506	-20.620**	2.839	6.129*
	(0.674)	(2.106)	(4.352)	(3.855)	(9.626)	(6.357)	(3.564)
Border Dummy	0.379	-3.640		-0.432			-4.168*
	(0.491)	(3.690)		(3.578)			(2.358)
Refugee Dummy	-1.172**	-6.265*	-5.977	-6.948*	-7.638	-3.098	
	(0.530)	(3.729)	(4.109)	(4.118)	(8.323)	(3.561)	
Dummy for 1997-2002 Period	-0.443***	0.452	1.191*	0.584	1.315	0.979	0.475
	(0.100)	(0.485)	(0.632)	(0.474)	(1.733)	(1.273)	(0.376)
Constant	13.658***	-77.038***	-95.921***	-87.149***	-206.895***	-104.738***	-30.195**
	(4.252)	(13.483)	(15.440)	(12.468)	(43.967)	(18.138)	(12.181)
Log-Likelihood	-72.91	-742.87	-732.14	-853.22	-250.74	-270.57	-288.18
p-value LR test	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Number of observations	66	282	322	360	125	129	106
% censored observations	0.00	33.69	46.27	41.39	56.80	47.29	16.04

Notes: The dependent variable is the natural logarithm of the average stock of FDI (for 1997–2001 and 2002–2006), where the zero observations are taken into account as censored observations. Robust standard errors are reported in parentheses. ***, **, * denote significance at the 1, 5 or 10 percent level, respectively. The border dummy has been dropped in the 'non-EU','low' and 'average' column because of multicollinearity (the two countries sharing a border with the Netherlands, Germany and Belgium, both are EU member countries and have high governance quality). Similarly, the refugee dummy has been dropped in the 'high' column because of multicollinearity.

Table 2.A: Variable Definitions

Sample	The benchmark sample consists of the 185 member states of the IMF plus eight countries for which the Dutch Central Bank reports outward FDI stocks in the 1997–2006 period and immigration data are available (Andorra, Aruba, Bermuda, Cayman Islands, Hong Kong, Liechtenstein, Netherlands Antilles, Taiwan). Note that Serbia and Montenegro were one country until June 3, 2006 and are thus treated as such. Timor-Leste was only founded in 2002 and is thus not part of the sample. Subsequently, Andorra, Myanmar, and Somalia are dropped because of lack of GDP data; Cayman Islands and the Maldives are left out because of the lack of fractionalization data; and Bermuda, Republic of Congo, Colombia, Gabon, and Peru are dropped because of negative FDI stocks. Negative FDI stocks do not have an interpretation in the context of the migration variable. With dropping the Netherlands, this brings the total number of observations in the cross section to 180. The benchmark sample is a pooled panel of two waves of equal length, 1997-2001 and 2002-2006, with 1996 being the first year for which immigration data disaggregated by country are available and 2006 is the latest year for which outward FDI stock data are available.	
Variable	Description	Source
FDI	The definition of FDI is according to *IMF Balance of Payments Manual* (1993). FDI distinguishes itself from other form of international investments in that it reflects the objective of an investor to obtain a lasting interest in an enterprise abroad. This lasting interest expresses itself in having significant control over the operations of an enterprise, which in turn is defined as holding at least 10 percent of the ordinary shares (or equivalent) in the foreign enterprise. Because measures of FDI based on balance of payments data do not take into account changes in FDI due to retained savings, valuation changes, and re-pricing the Dutch Central Bank collects data on the FDI stock through surveys. Until 2002, it surveyed 1,500 firms for the Dutch outward FDI stock on an annual basis. Since 2003, it has switched to monthly surveys of 1,000 firms (Van Wersch, 2003). The FDI stock (measured in Euros) is converted into 2000 constant US$ using the official EUR/US$ exchange rate and subsequently the 2000 constant US$ deflator, both available from the WDI data base.	Dutch Central Bank
Real GDP	In 2000 constant US$. Data for Afghanistan, Qatar, and Sao Tome and Principe are taken from IMF Country Reports and data for Liechtenstein, the Netherlands Antilles, and Taiwan come from local government sources and subsequently are converted into 2000 constant US$.	WDI
Real GDP per capita	In 2000 constant US$. Data for Afghanistan, Liechtenstein, the Netherlands Antilles, Qatar, Sao Tome and Principe, and Taiwan are calculated using population data available from the WDI, UN, and local government sources.	WDI
Distance	Great circle distance (in kilometers) between capital cities and Amsterdam. The distance for Liechtenstein is calculated by the authors.	CEPII
Governance	Institutional quality is measured by the average of the following six governance indicators: voice and accountability; political stability; government effectiveness; regulatory quality; rule of law; and control of corruption. The indicators range from -2.5 to 2.5 (with more positive values reflecting better institutional quality) and are available for 1996, 1998, 2000, and 2002–2007. Values for the unobserved years 1997, 1999, and 2001 are interpolated by taking the average of the previous and subsequent year. For nine countries (Aruba, Kiribati, Marshall Islands, Micronesia, Netherlands Antilles, Palau, San Marino, St. Kitts and Nevis, and Tonga) data for at least one of the six governance indicators are missing. The values for those countries are calculated by using the governance indicator value for the nearest year available.	Kaufmann et al. (2008)

Continued on next page

Immigrants	People living in the Netherlands who have at least one non-Dutch parent are referred to as immigrants. Immigration data are based on the registered population of the Netherlands. In principle, everyone who lawfully lives in the Netherlands (at an address reported to the municipal government) for an unlimited amount of time is registered. Immigrants are classified as first generation immigrants if born abroad with at least one parent born abroad and as second generation immigrants if born in the Netherlands with at least one parent born abroad. Within the group of second generation immigrants further distinction is made between those with one parent born abroad and those with both parents born abroad. Data for Aruba and the Netherlands Antilles are reported jointly and are separated subsequently by allocating their 2006 population share of the joint population to Aruba and the Netherlands Antilles, respectively. The same procedure is applied to the countries that made up the former Czechoslovakia (now Czech Republic and Slovakia); former Yugoslavia (now Bosnia-Herzegovina, Croatia, Macedonia, Serbia and Montenegro, and Slovenia); and former Soviet Union (now Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Russian Federation, Ukraine, Uzbekistan, Tajikistan, and Turkmenistan); as everyone born before the disintegration of those states is reported as born in those former states.	Statistics Netherlands
Colony	Dummy variable that takes the value of 1 if the country ever had a colonial link to the Netherlands. Data for Liechtenstein is added by the authors.	CEPII
Border	Dummy variable that takes the value of 1 if the country shares a land border with the Netherlands. The data point for Liechtenstein are added by the authors.	CEPII
Refugee Countries	Dummy variable that takes the value of 1 if the Netherlands received more than 200 people who are classified as refugees and people in refugee-like situations from a country for at least one year of the given period.	UNHCR Statistical Online Population Database
Fractionalization	The variable measures ethnic fractionalization, which involves a combination of racial and linguistic characteristics. (Ethnicity data for Latin American and Caribbean countries are often based on race (see Bolivia) while for some European countries it largely represents language (see Switzerland)). The measure varies between 0 and 1 and is calculated by 1 minus the sum of the squares of s_{ij} where s_{ij} is the share of group i in country j. Data on ethnic fractionalization are not available for Aruba, Netherlands Antilles, Sao Tome and Principe, and Yemen. The higher values of either linguistic or religious fractionalization are substituted instead.	Alesina et al. (2003)
Major FDI Recipients	Dummy variable that takes the value of 1 if the country belongs to the group of countries which, by descending largest FDI share, receive a cumulative 95 percent of the Dutch outward FDI stock.	Authors' calculation based on Dutch Central Bank data
Small Countries	Dummy variable that takes the value of 1 if the country has a population of less than one million.	WDI
Governance Quality	Dummy variable that takes the value 'high,' 'average' or 'low.' The governance quality of a country is classified as high if its governance value is larger than 0.5, low if the governance value is smaller than -0.5 and average if otherwise. This classification is based on the observation that the mean of the governance variable for the Tobit sample is just smaller than 0.	Kaufmann et al. (2008)

Chapter 3

Do Institutions Still Matter? International Bank Lending Before and After the Financial Crisis of 2008[1]

[1]I am grateful to Thorsten Beck and Jenny Ligthart for invaluable comments and suggestions and the Bank of International Settlement (BIS) for sharing their data with me. I thank seminar participants at Tilburg University and the Netherlands Network of Economics (NAKE) for helpful comments.

3.1 Introduction

The global financial crisis that started in mid-2007 brought an abrupt halt to international capital flows after years of rapidly rising financial globalization. International capital flows fell across all categories with cross-border bank lending exhibiting the largest fall. Figure 1 and Figure 2 illustrate the development of quarterly international bank lending flows from 1977 to 2009 both in constant U.S. dollars and in percent of world GDP. Until the late 1990s, quarterly cross-border banking flows remained below 5 percent of world GDP. In the subsequent decade quarterly flows steadily increased and tripled to around 15 percent of world GDP in the first quarter of 2007. From there, flows sharply fell to minus 12 percent of world GDP in the fourth quarter of 2008.[2]

Yet despite this increase in globalization of international capital flows in the years before the financial crisis of 2008, many developing countries still have limited access to international capital markets to finance domestic investment.[3] This development is in contrast to neoclassical theory that predicts that capital should flow from rich to poor countries, where marginal returns are higher. The phenomenon of the lack of capital flows from rich to poor countries has been coined the 'Lucas Paradox' after Lucas (1990) who first pointed out this discrepancy between theory and empirical observation. Lucas' work has spawned a host of explanations, including by Lucas himself, which can be grouped into two main categories. The first group is comprised of explanations that affect the fundamental underlying production structure of an economy such as differences in technology, missing factors of production or lack of complementarity to capital factors (Caselli and Feyrer, 2007). The second group is centered around explanations of international capital market imperfections including moral hazard (Gertler and Rogoff, 1990), a history of serial default (Reinhart and Rogoff, 2004), and informational frictions (Portes and Rey, 2005).

Alfaro et al. (2008) empirically examine the role of the different explanations put forward and conclude that during the period 1970 to 2000 institutional quality is the leading causal explanation for the lack of international capital flows to developing countries.

[2]This compares to annual global capital flows across all categories from below 5 percent of world GDP over the same period to over 20 percent in 2007 and a subsequent fall to less than 5 percent in 2008. This fall in international capital flows has been much sharper than for trade flows which, by comparison, fell by only 25 percent between the third quarter of 2008 and the first quarter of 2009 (Milesi-Ferretti and Tille, 2011).

[3]See for example Bosworth and Collins (1999) and Prasad et al. (2007). It is worth noting that some countries have been quite successful in attracting international capital flows in recent years to the degree that international banks have come to play a at times even dominant role in the financial structure of some developing countries (World Bank, 2008).

Papaioannou (2009) provides further evidence for this finding in the specific context of international bank lending flows using data over the period 1984 to 2002. Their explanation is that institutional quality as measuring the political, legal, and bureaucratic circumstances is complementary to capital and thus increases its returns. As such, access to international capital flows might be one of the mechanisms through which institutions affect long-run economic development (Acemoglu, 2005). However, their period of analysis ends in 2000 and 2002, respectively, just as international capital flows, and international bank flows in particular, take off.

This chapter combines data on international bank lending and the quality of institutions to study the role of institutions in attracting cross-border capital flows before and after the financial crisis. In particular, does the positive relationship between institutional quality and international capital flows hold during the rapid expansion of financial globalization? On the one hand, banks might continue to allocate their lending according to the same criteria as before. On the other hand, with rapidly increasing international lending volumes banks might become less discriminate during boom periods and institutions might matter less. Similarly, it is not obvious what happens in a period of massive retrenchment of capital flows such as during the recent crisis. On the one hand, countries with a better institutional environment might be relatively more insulated against declines in capital flows as lenders lend relatively less to countries with poorer institutional quality. On the other hand, cross-border lending might fall across the board and irrespective of institutional quality as banks reduce their international lending.

Combining bilateral data on quarterly international bank flows to up to 136 countries from 1984 to 2009 with measures of institutional quality I find that there appears to be an asymmetric relationship between institutional quality and cross-border bank flows during periods of boom and bust. Better institutions promote cross-border bank lending in the years leading up to the financial crisis, including during the period of rapidly rising flows from 2003 to 2007. At the same time, the results also indicate that this relationship breaks down during and in the immediate wake of the financial crisis. The positive relationship disappears for the overall sample, and, driven by flows to high-income, high institutional quality OECD countries, indeed even turns negative. However, when restricting the sample to emerging markets vis-à-vis countries, countries with higher institutional quality appear to still hold a small advantage in attracting cross-border capital flows.

The chapter speaks to several literatures. First, it contributes to the literature on the Lucas Paradox as discussed above by documenting the relationship between institutional

quality and international capital flows. As such it is also closely related to empirical work that examines how institutional quality and informational frictions affect different types of international capital flows (see for example Wei, 2000a and 2000b; Portes et al., 2001; Wei and Wu, 2002; Buch, 2003; Portes and Rey, 2005; and Gelos and Wei, 2005) in addition to the already mentioned work specifically on institutional quality and international bank lending by Alfaro et al. (2008) and Papaioannou (2009). Employing for the most part cross-sectional approaches those papers document a significant relationship between different measures of institutional quality such as corruption, bureaucracy, transparency, and overall institutional quality. With the exception of Gelos and Wei (2005), who examine the role of transparency in equity investment fund flows to emerging markets from 1996 and 2000 and consider the effect of the Asian and Russian financial crisis of 1997-1998, the asymmetry of the role of institutions has so far not been considered in this literature. The chapter thus contributes to this literature by providing evidence that while institutions can explain the lack of bank lending flows to developing countries during periods of increasing international capital flows this relationship generally breaks down during dramatic falls in cross-border bank lending such as during the 2008 global financial crisis.

Second, the chapter provides empirical evidence to the theoretical models that show that capital market imperfections in the form of lack of institutional quality can deter or even reverse the direction of international capital flows contrary to predictions of the frictionless neoclassical model.[4] The most closely related theoretical model comes from Shleifer and Wolfenzon (2002) who show that better investor protection generates higher returns for investors, both domestic and foreign, and that investors are thus unlikely to invest in countries with weak investor protection. In particular, they build a model in which entrepreneurs set up firms and seek external finance from investors and where investor protection varies by country. Entrepreneurs maximize their personal wealth which, among other things, is a function of the amount of revenue they are able to divert from the firm. Because better investor protection makes diversion more costly to entrepreneurs, expected diversion is lower in countries with better institutions. Anticipating the likelihood of diversion, investors are thus reluctant to invest in countries with low levels of investor protection.

Third, this chapter speaks to a large law and finance literature (see La Porta et al., 1998 and 2008 for an overview) that links legal and regulatory frameworks to access and availability of financial products and in turn economic growth.

[4]See Ju and Wei (2010) for an overview.

Finally, the chapter also contributes to the literature on the global financial crisis and its effects on international capital flows. Milesi-Ferretti and Tille (2011) provide a detailed overview of the impact and the timing of the crisis on different types of international capital flows. Herrmann and Mihaljek (2010) study the spillover effects of economic boom and bust in developed countries to a select group of emerging markets countries via international bank lending using data until 2008. Cetorelli and Goldberg (2009), Bank for International Settlements (2009a, 2009b and 2009c) and Hoggarth et al. (2010) consider the transmission effects of the international financial crisis through international bank lending. None of the papers though consider the role of institutions in international bank lending flows during the crisis.

The remainder of this chapter is organized as follows. Section 2 describes the data sources used to construct the dataset. Section 3 presents the empirical methodology. Section 4 discusses the results and additional robustness checks are examined in Section 5. Section 6 concludes.

3.2 Data

The sample is constructed from two main sources. The first is a dataset on bilateral international bank flows. The second set contains measures of time-variant institutional quality. I explain each of the two datasets in turn as well as discuss the sources of additional variables.

3.2.1 International Bank Flows

The data on bilateral quarterly international bank flows comes from the Bank for International Settlements' (BIS) Locational Banking Statistics.[5] Data published in this statistics

[5]The BIS publishes data on international bank flows under two complementary concepts, locational and consolidated. Under the locational concept, assets and liabilities are reported based on the residence principle. The reporting banks include both banks headquartered in the country and affiliates of foreign banks. Under the consolidated concept, assets and liabilities are reported based on the international exposure of banks, including cross-border lending through foreign affiliates but not of inter-office positions. The consolidated data consists of three types of lending activities: cross-border lending, lending through foreign affiliates in local currency, and lending through foreign affiliates in foreign currency. The BIS makes the consolidated data available both at the immediate (starting in 1983) and ultimate exposure basis (starting in 2005). The former considers the geographical location of the entity the bank lends to and the later takes into consideration risk transfers such as derivates or guarantees and looks at the residency of the ultimate guarantor of the claim (BIS, 2009d). This chapter uses data published under the locational concept because the aim is to understand the cross-border lending flows to the rest of the

series covers the cross-border assets and liabilities of banks located in up to 43 countries or territories ("reporting countries") to more than 200 countries or territories ("vis-à-vis countries") on a quarterly basis since 1977. Due to the hub-like nature of international banking, the data covers nearly all cross-border bank relationships despite its seemingly limited reporting area.[6] It consists of the on-balance sheet exposure of banks and its three main components are loans and deposits, holdings and own issue of debt securities, and other assets and liabilities which include mainly portfolio and direct investment. Data on international assets and liabilities outstanding is originally collected by national monetary authorities. Flows are estimated by the BIS as exchange rate adjusted changes in the amounts outstanding to account for valuation effects. Potentially large valuation effects in capital flows data can arise because exchange rate fluctuations impact the current US dollar value of non-dollar stocks and thus can mechanically alter the value of assets and liabilities from one period to the next; just taking the difference between stocks can therefore be inadequate. The BIS uses the currency denomination of assets and liabilities reported by the national monetary authorities to construct those exchange rate adjusted flows.[7]

In my analysis I use the data on bank (asset) flows from 18 OECD reporting countries converted into real terms using the US GDP deflator. I exclude financial off-shore as well as developing reporting countries from my main analysis. See Appendix 3.A for a list of countries in the sample and the first year of data available.[8]

world. Using the locational data has also other advantages: First, a longer time-series for a larger number of countries is available. Second, exchange rate adjusted flows are available which smooth out valuation effects that might be especially of concern in relatively long panels such as used in this chapter. And finally, unlike in the consolidated statistics flows between parent banks and their foreign affiliates are not excluded.

[6]The BIS asks countries to contribute to the Locational Banking Statistics as a reporting country once their cross-border banking activity becomes "substantial" (BIS, 2008). The Locational Banking Statistics started out with 14 industrial countries encompassing the reporting area in 1977. In its first expansion in 1983 it added 9 additional countries, both industrial and financial off-shore centers, to its reporting area. With the addition of one more country in 1987 the reporting area remained constant through the mid-1990s before BIS started adding more countries, especially in the early 2000s, arriving at today's number of reporting countries. See Appendix 3.A for the year each reporting country started contributing to the Locational Banking Statistics.

[7]See BIS (2009d) for details on how exchange rate adjusted flows are constructed.

[8]While aggregate data by country is made publicly available on the BIS website, bilateral data is only made available to researchers upon request and granted on an individual basis by each reporting country. Out of the up to 43 reporting countries, 27 countries made their data available. Of the 16 countries which declined to make their data available are eight financial off-shore centers and three have been added to the statistics series only in 2008 or later. My sample of 18 OECD reporting countries is similar to Papaioannou (2009) and Herrmann and Mihaljek (2010) who use data from 19 and 17 OECD reporting countries, respectively.

3.2.2 Institutional Quality

I use the International Country Risk Guide's (ICRG) political risk rating published by Political Risk Services to measure institutional quality. The ICRG rating is especially suited as measure of institutional quality in the context of this chapter as it captures potentially fast-changing institutional characteristics rather than more permanent characteristics and exhibits substantial within-country variation.[9] As Papaioannou (2009) points out this allows me to test whether improvements in institutional quality over time are associated with increased capital flows. The possibility that political, legal, or bureaucratic circumstances might change and endanger their investment is a key risk factor that international investors face.[10]

The political risk rating is constructed from 12 variables that measure the effectiveness and stability of political, legal, and bureaucratic institutions. It ranges in value from 0 to 100 with higher value indicating better institutional quality (or, conversely, lower political risk). The rating is available since 1984 on a monthly basis for a wide variety of countries and can therefore be easily merged with the BIS data. The merged dataset contains information on both bank flows and institutional quality for 136 vis-à-vis countries. See Appendix 3.B for more details on the variables used to construct the rating.

The political risk rating is one of three risk ratings used to construct the ICRG's composite rating. Besides the political risk rating, ICRG also constructs economic and financial risk ratings based on 50 points and 5 variables each (see Appendix 3.B for details). To arrive at the composite risk index, the points from the three sub-indices are added and divided by 2. It thus also ranges in value from 0 to 100 with higher values again indicating a better institutional quality. Some of the variables incorporated in the financial and economic risk rating are already explicitly controlled for in the empirical model specification below. However, as robustness check I test whether the results are sensitive to adding the financial or economic risk rating or using the composite rating instead.

[9] Glaeser et al. (2004) draw attention to the fact that because measures of political institutions, including data from ICRG, have high within-country variation they fail to capture permanent institutions.

[10] While the ICRG data does not capture more permanent institutions by design – though it does consider the stability of the governance components – , one could argue that for countries that see very little within-country variation those institutions are in a sense permanent. In as far as there are underlying, permanent institutions on the country level and they are time-invariant over the up to 25 year period covered in the sample, they are captured by the country fixed-effects included in some of the specifications below.

3.2.3 Other Variables

Data on other control variables in the dataset comes from a variety of sources. Data on distance, common language and colonial ties comes from Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) while data on GDP per capita, US GDP deflator, GDP growth, population and real interest rates are taken from the World Bank's World Development Indicators (WDI) database. I construct the variables GDP growth rate differential and real interest rate differential by subtracting the value of the reporting country from the vis-à-vis country.

I combine data from two sources to construct the bilateral exchange rate regime dummy. First, I use the de facto monthly fine classification of exchange rate regimes from Ilzetzki, Reinhart and Rogoff (2008) which is available on a monthly basis for an unbalanced panel from the 1946 to 2007. I code the exchange rate regime dummy as equal to one if the vis-à-vis country is either a member of the same currency union as the reporting country or de facto pegged its currency to that of the reporting country (classification codes 1 to 4). Unfortunately, the Ilzetzki, Reinhart and Rogoff dataset is not a bilateral one and thus does not include information with regard to which country the currency is pegged to or with which countries it forms a currency union. To turn the dataset into a bilateral one I use the Klein and Shambaugh (2006) dataset on exchange rate regimes to identify the counter party country of the currency union or peg. The Klein and Shambaugh data covers the period 1960 to 2004. Since the Ilzetzki, Reinhart and Rogoff data only goes through 2007 and the Klein and Shambaugh only through 2004 I forward fill the data to 2009 and check the coding against the information in the Country Notes section of the IMF's International Financial Statistics Yearbook for changes in the exchange rate regime and make adjustments as necessary.

See Appendix 3.C for details on variable definitions and sources.

3.2.4 Summary Statistics

Summary statistics for the sample are presented in Table 3.1. The average quarterly bank flow between reporting and vis-à-vis country over the entire sample period is 85 million in exchange rate adjusted terms in 2000 constant U.S. dollars. This average, however, masks a large variation as the minimum and maximum value suggest. Note that bank flows can take negative values. This can occur because bank flows are net flows in the sense that they include repayments for loans or other investments. Therefore, if scheduled

repayments of loans or other investments originated in earlier quarters exceed loans or other reported investments to a given country in the current quarter, bank flows will be negative (but stocks still positive). About 80 percent of flows fall between -77 million and 163 million with the remaining 20 percent of observations split equally between both tails. The largest negative flows are, not surprisingly, recorded in 2008 and 2009 to high-income OECD countries and in particular the United States and the United Kingdom. Likewise unsurprisingly, the largest positive flows are recorded just before the crisis, in 2006 and 2007 to high-income OECD countries with again the United States and the United Kingdom in particular.

Institutional quality varies substantially, from an index value of 7 in Liberia to 97 in the Netherlands and Switzerland and with a mean of 65. However, the variation in institutional quality is not just on the cross-country level. Liberia, for example, saw its institutional quality plummet to an index value of 7 during its civil war in the early 1990s, down from values around 40 in the mid-1980s. By the time a peace deal was signed in 1995 its institutional quality rating had improved to values around 30. In subsequent years, Liberia has been mostly able to improve its institutional quality rating, reaching values in the high 50s in the late 2000s. Similarly, the index values for the Netherlands and Switzerland are not constant. They are, however, comparatively stable – ranging in value from the low 80s to the mid 90s over the entire sample period for both countries – as they indeed generally do for high-income OECD countries. About 11 percent of the bilateral relationships in the sample share a common official language and 6 percent share colonial ties.

Table 3.2 reports the correlation matrix for all bilateral observations in Panel A and in Panel B the correlation matrix for independent vis-à-vis country-quarter observations with banks flows averaged across all reporting countries. The correlation matrixes suggest significant correlations between bank flows and institutional quality, both as captured by the political risk rating as well as by the economic, financial and composite risk ratings. Between the three subcategory risk ratings, the political risk rating interestingly shows the highest correlation coefficient with 0.086 in Panel A and 0.245 in Panel B. This correlation coefficient estimate is also higher than the correlation coefficient estimates between bank flows and the traditional gravity control variables such as GDP per capita in the vis-à-vis country, distance, and the dummies for common language and colonial ties. Excluding the inter-correlation between the different measures of institutional quality, the highest correlation coefficient in the table is between GDP per capita in the vis-à-vis country

and the institutional quality in the vis-à-vis country with correlation coefficients ranging from 0.63 (economic) to 0.76 (composite) for the different measures in Panel A. Similar correlations are found in Panel B.[11]

3.3 Methodology

I use variants of the following empirical specification to estimate the effect of institutional quality on international bank flows:

$$\begin{aligned} \text{Bank Flows}_{ijt} &= \text{X'}_{it}\beta + \text{Y'}_{it}\gamma + \text{Z'}_{ijt}\delta + \zeta \text{ Institutional Quality}_{jt} \\ &+ \eta \text{ post-2008Q2 * Institutional Quality}_{jt} + \theta_t + \varepsilon_{ijt} \end{aligned} \tag{3.1}$$

where the dependent variable is the logarithm of exchange rate adjusted international asset flows from reporting country i to vis-à-vis country j in quarter t. Vectors X and Y include control country characteristics in countries i and j, respectively, such as the logarithm of GDP per capita and vector Z includes bilateral variables such as dummies for common official language and colonial ties and the logarithm of distance between the two countries. The specification also includes a vector of time fixed-effects θ_t. The variable of interest is institutional quality which is measured primarily with the ICRG political risk rating. The error term is denoted by ε_{ijt}.

To capture any potential asymmetric effect of the role of institutions before and after the financial crisis, I include an interaction term between the post 2008Q2 quarters (already captured by the time fixed-effects) and institutional quality. I choose the second quarter of 2008 as the onset of the crisis because it is the first quarter in which international bank flows fell sharply after years of steady, though not necessarily smooth expansion as illustrated in Figures 1 and 2. While there were signs of the financial crisis to come with the outbreak of stress in financial markets as early as in summer 2007, the collapse of the investment bank Bear Stearns in mid-March of 2008 underlined the seriousness of the crisis for many for the first time. The third quarter saw a short reprieve from the decline of cross-border bank lending before the flows decreased even further in the wake of the bankruptcy of Lehman Brothers and the bail-out of American International Group (AIG) in mid September.[12]

[11] The within vis-à-vis country correlation coefficients between GDP per capita in the country and the different institutional quality measures are much lower.

[12] See Milesi-Ferretti and Tille (2011) for a discussion of how different types of capital flows fared during

The dependent variable, bank flows, can take negative values. Recall that this can occur when a reporting country decreases its stock of assets in a given vis-à-vis country, resulting in negative flows but still positive stocks. Bank flows are net flows in the sense that they include repayments for loans or other investments. Therefore, if scheduled repayments of loans or other investments originated in earlier quarters exceed loans or other reported investments to a given country in the current quarter, bank flows will be negative and the stock of bank assets in the vis-à-vis countries will decline. Following Papaioannou (2009) and Herrmann and Mihaljek (2010), who also use BIS bank flow data in their analysis, I take the logarithm of the absolute value and then change the sign back to the sign of the original variable. This transformation preserves both the sign of the original variable and the symmetry between increases and decreases in flows.

The empirical specification is in essence a standard gravity model. First conceived by Tinbergen (1962), it states in its basic form that trade between two countries is directly related to their size and inversely to the distance between them. It has since become a workhorse model for explaining not only bilateral trade flows but also capital flows in recent years (Wei, 2000a) and been shown to be consistent with theoretical models (Okawa and Wincoop, 2010).[13] In addition to the basic factors of size and distance, gravity models often include other variables that either promote or deter trade or capital flows such as dummy variables that indicate a special relationship between country-pairs such as colonial ties or a common official language.[14]

The main challenge in identifying the effect of institutions is potential omitted variable bias. It arises because it is hard to control for all the potential factors that might influence international lending in a cross-country context. To counter potential omitted variable bias I will exploit the time-series dimension of the panel and include, next to a pooled model, two fixed effects (FE) specifications. In particular, I will include one specification with reporting country FE and vis-à-vis country FE to control for any unobserved time-invariant country characteristics. The second specification adds FE for each reporting and vis-à-vis country-pair and thus isolates the within country variation for each country-pair. Errors are either clustered at the vis-à-vis country or the country-pair level, depending on

different stages of the financial crisis.

[13]See also the discussion on the empirical model in Chapter 2 where we use a gravity model for foreign direct investment (FDI).

[14]The model includes GDP per capita to capture economic size of countries. Others include GDP and population separately instead which is equivalent to including a per capita measure of economic size. The results reported below are robust to the alternate specification that includes GDP and population instead of GDP per capita.

the FE specification.

A second challenge to identifying the effect of institutions on international capital flows is that any relationship might be driven by reverse causation. However, unlike in the omitted variable case, there is no clear way to address this issue. A standard approach to address potential endogeneity is instrumental variables. Papaioannou (2009), for example, addresses concerns of endogeneity by using a cross-sectional specification of the average annual bank lending flows over 1984 to 2002 as dependent variable and the initial (1985) value of institutional quality on the right-hand side which he also instruments with legal origin dummies and population density in the year 1500, following approaches in the law and finance literature (La Porta et al., 1998 and 2008) and the literature on the role of institution in economic growth (see Acemoglu et al., 2001 and 2002). He finds that even when instrumented the role of institutions is significant. However, this approach has two drawbacks. First, by collapsing the data into a cross-section this approach renders institutional quality time-invariant when it is exactly the time-variant nature of the political, legal, and bureaucratic circumstances that might endanger investments and that this research is interested in. Second, it is not clear that legal origins or population density in the year 1500 are appropriate instruments. Glaeser et al. (2004) have drawn attention to the fact that measures of political institutions, including data from ICRG that is used here, have high within country variation and thus fail to capture permanent institutions. But it is exactly permanent institutions that the variables legal origins and population density attempt to measure.

Another approach is the use of lagged values of the variables of interest to temporally disentangle a potentially endogenous relationship. In unreported robustness checks, I lag the institutional quality variable by one quarter. The results remain robust to the findings reported in the following section. Note that by taking the lagged variable approach to the extreme one arrives at an initial value specification. However, an initial values specification or even lags of relatively high order create a problem: they take away the time-variation that this research is interested in.[15]

3.4 Results

This section reports the main results first for the entire period, including specifications for the potentially asymmetric effect of institutions before and after the crisis; then for the pre-

[15]Papaioannou (2009) also employs this approach.

crisis period, including specifications allowing for the heterogeneous effect of institutions as international bank lending takes off; and finally for just the post-crisis period to tease out the role of institutional quality as international bank flows first sharply drop and subsequently begin to recover.

3.4.1 Entire Period

The OLS estimates of quarterly bilateral bank flows in real terms from 18 reporting countries to 136 vis-à-vis countries over the entire sample period, 1984 to 2009, are presented in Tables 3.3 through 3.8. Table 3.3 includes only institutional quality and the standard gravity controls as independent variables while additional control variables are added in Tables 3.4 through 3.8.

Specification (1) in Table 3.3 reports the results of a standard gravity model of international bank flows for the pooled model.[16] The coefficient estimates are in line with expectations: bilateral flows are larger the richer the reporting country. The positive coefficient of the GDP per capita variable for the vis-à-vis country provides evidence for the Lucas paradox that capital flows to rich countries. The dummy for colonial ties enters with a significantly positive coefficient, suggesting that shared historical linkages and possibly institutional familiarity or even similarity do increase bank flows. Distance also enters significantly, but as expected negatively as distance here proxies for costs of informational distance that increases with physical distance (Portes and Rey, 2005). The dummy for sharing an official language is insignificant.

Specification (2) adds the institutional quality variable to the model which enters positively and significantly. The coefficient estimate implies that a 10 point increase in institutional quality is associated with an on average 14 percent increase in international banking flows to the vis-à-vis country over the entire sample period. Specification (3) adds

[16]In unreported results I also control for the lagged exchange rate by including either the nominal effective exchange rate or real effective exchange rate for both the reporting and the vis-à-vis countries as they may explain some of the results. In the model with the nominal effective exchange rates, the exchange rates are only statistically significant in the model specification without any reporting and vis-à-vis or country-pair FEs. In the model with the real effective exchange rates, the rates are significantly negative for the reporting country and significantly positive but virtually zero for the vis--vis country across all model specifications. In either case the coefficient estimates on the other variables remain stable compared to the baseline model without any exchange rate control variables. Including the exchange rates reduces the sample size by 40 percent due to limited data availability. Because of the stability of the variable coefficients, significant sample reduction and the fact that bank flows are reported on an exchange rate adjusted basis and thus mitigating the concerns, I have chosen to not include exchange rates in my baseline model.

an interaction term between institutional quality and the post-crisis period to allow for potential heterogeneous effects of institutional quality before and after the retrenchment of cross-border capital flows in the second quarter of 2008. The interaction effect is significantly negative and about twice the size of the level effect, indicating that after the onset of the financial crisis there was a reversal in the relationship between institutional quality and bank flows. Instead of higher institutional quality leading to more capital inflows, higher institutional quality post-crisis is associated with lower cross-border bank lending. Given that the countries that typically achieve high institutional ratings, that is high-income OECD countries, were particularly affected by the crisis one might wonder whether those results are driven by banks scaling back on lending to those countries most affected by the crisis. To test this hypothesis I include a measure of the cost of the financial crisis below and run a number of robustness checks.

Before turning to those robustness checks, however, I repeat the analysis of the first three columns by first adding reporting and vis-à-vis country FE in columns (4) to (6) and country-pair FE in columns (7) to (9). Even though the addition of FE changes the interpretation from one of cross-country variation to one of within country variation in columns (7) to (9), the coefficients remain remarkably stable across the specifications: the results suggest that a 10 point improvement in institutional quality is not only associated with a 14 percent increase in bank lending inflows across countries (column (2)) but also within countries (column (8)).

Such improvements in institutional quality within a country are not unusual. As already discussed in the summary statistics section, Liberia increased its institutional quality rating from its absolute bottom of 7 points during the civil war to almost 30 points over a two-year period between 1993 and 1995, when a peace deal was signed. Vietnam is another example of a country that saw a swift increase in institutional quality. From the first to the second quarter of 1993 Vietnam increased its rating from 55 to 64 index points as its implementation of economic reform under Doi Moi – which involved the dismantling of central planning, the promotion of private business, the liberalization of trade and an increase in political liberties – took hold. Similarly, Chile saw an increase in its institutional quality rating of six points in the year after the fall of the military regime under Pinochet. Chile further improved its rating up to a high of 82.5 index points in the second quarter of 2006 as its democratic institutions evolved and it implemented economic reforms of deregulation. This compares to values in the mid-40s under Pinochet in the mid-1980s.

To check whether the differential impact for high and low institution countries is unique

to the financial crisis of 2008 I test whether there was also a differential impact following the Dot-Com crisis in the early 2000s. In Table 3.4 I therefore add an additional interaction effect for institutions during the period second quarter 2000 (bursting of the Dot-Com bubble) to last quarter of 2001 (official end of the recession) to the baseline model. The interaction effect is insignificant across all specifications. This provides some evidence that high and low institution countries did not experience a differential impact during a previous economic downturn and that the differential impact of institution in the post 2008Q2 period is due to fall in international bank lending during the recent financial crisis, not a likely general feature of economic downturn in reporting countries.

Table 3.5 includes a variable that measures the cost of the financial crisis of 2008 as percent of GDP from Laeven and Valencia (2010) to test whether the negative effect of institutions during the crisis is driven by the pull back of money from countries most affected by the crisis. The cost of the financial crisis is computed as the cumulative difference between actual and trend real GDP for a period of three years since the start of the crisis, that is here 2008–2010, with higher values indicating a greater cost.[17] It is set to zero before the onset of the financial crisis (second quarter of 2008) and also set to zero if no output loss due to the crisis is recorded. I include the cost of the crisis for both the reporting and the vis-à-vis country as one would expect that the severity of the crisis affects both how much a reporting country lends as well as how much a vis-à-vis country receives in international bank lending.

This expectation is confirmed for both the reporting and the vis-à-vis country. The highly significant and negative coefficient estimate on the cost of the crisis in the reporting country suggests that cross-border bank lending decreases by 0.5 percent for each percentage point increase in the cost of the crisis across reporting countries in specifications (1) through (3). The coefficient estimate is similarly negative and highly significant when measuring the cost of the crisis in the vis-à-vis country. This suggests that countries which experienced a relatively more severe economic contraction due to the financial crisis saw less cross-border banking inflows with inflows decreasing by 1.4 (0.7) percent for each percentage point increase in the cost of the crisis in the vis-à-vis country in columns (1) and (2) (column (3) with interaction effect). On the one hand, this might have been driven by less demand in the vis-à-vis country which might have resulted in fewer investment opportunities. On the other hand, it is also conceivable that banks reacted to the overall macroeconomic situation and a (perceived) increase in risk and, as a result, banks were

[17]For the United States and the United Kingdom Laeven and Valencia (2010) consider the start of the crisis to be in 2007 and calculate the cost of the crisis accordingly for the period 2007-2009.

more reluctant to invest in countries affected most by the financial crisis.

The results largely hold once separate reporting and vis-à-vis country FE are included in columns (4) to (6) and country-pair FE are included in columns (7) to (9) though the size of the coefficient estimates, especially in the vis-à-vis country, increases. The inclusion of the variable measuring the cost of the financial crisis, however, does not alter the result of the role of institutions found in the benchmark results of Table 3.3: better institutional quality leads to more cross-border lending in the pre-crisis period but this relationship breaks down after the onset of the financial crisis.

However, bank flows may have not only responded to the economic conditions in a country but may also have contributed to the severity of the crisis. To mitigate those endogeneity concerns, in Table 3.6 I replace the cost of the financial crisis for both the reporting and vis-à-vis country by a dummy variable equal to one if the country experienced a banking crisis and zero otherwise. The results indicate that the reporting and vis-à-vis countries that experience a banking crisis send and receive, respectively, less cross-border lending. As before, the role of institutions remains relatively robust to the inclusion of the banking crisis dummies: better institutional quality leads to more cross-border lending in the pre-crisis period but the relationship once again breaks down after the onset of the financial crisis. However, in the specification controlling for reporting and vis-à-vis country FE in columns (4) to (6) and country-pair FE in columns (7) to (9) the interaction term decreases in absolute size to 0.18 – or about half its size compared to the baseline results in Table 3.3 – which, combined with the coefficient estimate for the level effect of 0.14, results in an overall effect closer to zero compared to the baseline results.

Yet another way to test whether the negative effect of institutions during the crisis is driven by the pull back of money from countries most affected by the crisis is to control for non-performing loans (NPLs) as percentage of total loans. The share of NPLs is a proxy for the soundness of lending practices and the prediction is that higher NPL ratios result in increasing cross-border lending for the reporting country but a reduction in international bank lending for vis-à-vis countries.

Comparable cross-country data on NPLs as percentage of total loans is available from the IMF's Global Financial Stability Report on an annual basis since 2005 for up to 101 countries. Table 3.7 reports the results of including the NPL share for both the reporting and vis-à-vis country as additional variables in the baseline specification for the period 2005 to 2009. As expected, I find that the non-performing loan ratio is significant for both the reporting country (positive) and the vis-à-vis country (negative). An exception

are the specifications controlling for country-pair FE; here the NPL ratio is statistically insignificant for the reporting country. Compared to the baseline specification the coefficient estimates on the institutional quality variable and its interaction term yield the same overall effect. However, when the level and interaction term are combined, the negative effect is comparatively closer to zero. This provides more corroborating evidence that banks scaled back lending especially to those countries most affected by the crisis.

The results from Table 3.3 regarding the role of institutions also hold once the additional control variables growth rate differential, real interest rate differential, and exchange rate regime dummy are added in Table 3.8. The three additional variables each proxy pull-factors for international banking flows. Higher growth and interest rates in the vis-à-vis country compared to the reporting country signal better investment opportunities and should, ceteris paribus, attract more bank flows to the vis-à-vis country. On the other hand, a stable bilateral exchange rate eliminates one of the risks of foreign investment, namely uncertain returns due to potential exchange rate fluctuations. Vis-à-vis countries should therefore also see increased bank flows if their exchange rate is in a stable relationship to the reporting country either through a currency union or de facto peg.

The results in Table 3.8 indicate that none of the additional controls are significant in the pooled specification or the specification with separate reporting and vis-à-vis country FE in columns (1) to (6). However, the coefficients on the exchange rate regime dummy and the variable measuring the growth rate differential are significant and as expected positive when explaining the within country variation in the country-pair FE models. This suggests that within a bilateral relationship international lending increases as the exchange rate between the currencies becomes fixed and the growth rate differential increases.

Note that the inclusion of the additional variables significantly reduces the sample size. In an exercise not reported here, I have run the specification of Table 3.3 for the sample of Table 3.8 and the results remain comparable to the original estimates of the maximum sample. The results of Table 3.8 can thus be compared to the ones in Table 3.3.

I next turn to analyze the pre-crisis and post-crisis period separately.

3.4.2 Pre-Crisis Period

Table 3.9 essentially repeats the analysis of Table 3.3 for the pre-crisis period, covering the years 1984–2007. Instead of including a dummy variable for the onset of the financial crisis and its interaction term with institutional quality as in Table 3.3, Table 3.9 includes a dummy variable equal to one for the observations after 2003. This allows me to test

whether the role of institutional quality in promoting cross-border lending has changed in light of the steadily increasing flows during this period. Alfaro et al. (2008) and Papaioannou (2009), who have previously examined the relationship between institutional quality and international bank lending flows, only analyze data through 2000 and 2002, respectively, and therefore miss most of the boom period in international bank lending. The results reported in Table 3.9 largely confirm the findings in Table 3.3 and suggest that better institutions promote international bank lending. The interaction effect is positive and significant at the one percent level and about 1.5 times as large as the level effect. The results in column (3) suggest that a 10 point increase in institutional quality leads to an 11 percent increase international bank flows in the years up to 2002. The coefficient estimate on the interaction term indicates that this effect increases to 28 percent for the period 2003 to 2007. This finding holds across all specifications, the pooled one and the ones controlling for reporting and vis-à-vis country FE and country-pair FE.

3.4.3 Crisis and Initial Recovery Period Only

In Table 3.10 I turn to analyze in more detail the period after the onset of the crisis to sample end, that is the period from the second quarter of 2008 to the last quarter of 2009. I do this by including interaction effects with institutional quality for each quarter separately to tease out the role of institutional quality as international bank flows first sharply drop and subsequently begin to recover.

The estimates in the pooled specification in column (1) indicate that the coefficient estimate for institutional quality is still significant and positive for the second quarter of 2008, the omitted base quarter. However, its interaction effects for all subsequent quarters show that the relationship is first weakening in the third quarter before turning overall negative in the fourth quarter of 2008. During the first two quarters of 2009 the negative interaction coefficients become progressively smaller, turning the overall effect even positive in the second quarter. But the return to a positive net effect of institutional quality as international bank lending recovers does not last and by the fourth quarter of 2009 the coefficient estimates again suggest an overall negative effect.

When controlling for reporting and vis-à-vis country FE and country-pair FE effects, the coefficient estimates for the interaction terms follow a similar pattern though the level effect is not significantly positive. This means that when looking at the within country variation and within country-pair variation, respectively, the relationship between institutional quality and cross-border bank flows is negative or at best breaks down and is not

significantly different from zero.

3.5 Robustness Checks

3.5.1 Are Results Driven by Banks Avoiding Countries Most Affected by Financial Crisis?

The results in Table 3.3 above suggest that there is a reversal in the relationship between institutional quality and bank flows after the onset of the financial crisis. Instead of higher institutional quality leading to more capital inflows, higher institutional quality after the onset of the crisis is associated with lower cross-border bank lending. To test whether this effect is driven by the high-income, high institutional quality countries that were affected the most by the financial crisis, I have controlled for the cost of the financial crisis and the presence of a banking crisis in both the reporting and vis-à-vis country in Table 3.5 above. Here, I consider two sub-samples as further robustness tests.

First, I exclude high-income OECD vis-à-vis countries from the sample. The results are reported in Table 3.11 and show that while the level effect of the institutional quality variable remains about the same, the coefficient estimate of the interaction term halves. The combined effect is still negative or at least cancels out suggesting that the positive relationship between international bank lending and institutional quality has broken down across all specifications even when excluding high-income OECD countries. It also provides some evidence for the suggestion that the negative effect of institutional quality found in the earlier tables could be interpreted as compensation for overinvestment in high quality, high-income countries during the boom period in international banking flows.[18]

Second, I consider only cross-border bank lending to 33 emerging markets countries as covered by the S&P Emerging Markets Index.[19] The emerging markets countries sample by virtue of construction includes countries that have significant investment opportunities available while at the same time their institutional environment tends to be at a lower level

[18]In unreported results I also test whether the results might be driven by dynamics between countries in the European Union. To that end I exclude EU member countries both as reporting and vis-à-vis countries from the sample. The results with regard to the relative effect of institutional quality before and after the onset of the financial crisis are comparable to the results of Table 3.11.

[19]The 33 countries are: Argentina, Bahrain, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Israel, Jordan, South Korea, Kuwait, Malaysia, Mexico, Morocco, Nigeria, Oman, Pakistan, Peru, Philippines, Poland, Qatar, Russia, Saudi Arabia, South Africa, Sri Lanka, Taiwan, Thailand, Turkey, United Arab Emirates, and Zimbabwe. A 34th country included in the S&P Emerging Markets Index, Taiwan, is excluded due to data availability issues.

and less stable than that of industrialized nations. They thus comprise a selection of countries which might benefit in particular from offering a relatively high-quality institutional environment to investors. Emerging markets countries, as a whole, have also not been as significantly affected by the financial crisis compared to their developed counterparts (Milesi-Ferretti and Tille, 2011).

The results reported in Table 3.12 suggest that emerging markets countries with a better institutional quality are indeed attracting more cross-border lending and the coefficient estimate on the level effect is with 0.017 slightly higher than that for the entire country sample in Table 3.3 with 0.014 in the pooled models in columns (2). This suggests that in the emerging markets sample a 10 point increase in institutional quality yields a 17 percent increase in cross-border bank lending to the vis-à-vis country compared to a 15 percent increase in the overall sample. Similar to the all-country specification the interaction term added in column (3) is significantly negative though with minus 12 percent it is less than half as large. When combined with the level effect, the results suggest that emerging countries with better institutions continue to enjoy a positive albeit small advantage in attracting capital flows. Again, these results hold when controlling for reporting and vis-à-vis country FE and country-pair FE. This finding is in line with results by Gelos and Wei (2005) who provide evidence that during the Asian and Russian crisis of 1997 to 1998 managers of equity funds with investments in emerging markets avoided less transparent countries to a larger extent.

3.5.2 Are Results Sensitive to Adding Other Institutional Dimensions?

As discussed in the data section, my measure of institutional quality, the political risk rating, is one of three sub-indices ICRG uses to construct its composite risk rating. The high correlation coefficients between the sub-indices reported in Table 3.2 might raise the concern that rather than capturing the political, legal, or bureaucratic circumstances my measure of institutional quality actually captures the macroeconomic or financial situation of a country as captured by the economic and financial risk ratings, respectively. This section explores the sensitivity of the results to the inclusion of the other two components, the economic and financial risk ratings, as well as to the use of the composite risk rating instead of the political risk rating. Results are reported in Tables 3.13 through 3.15.

I first augment my baseline model with the economic risk rating. The coefficient estimate on the economic risk rating variable is positive and significant throughout except in

the pooled model in column (2). The addition of the economic risk rating does not diminish the effect of the (political) institutional quality measure, which remains in magnitude similar to the coefficient estimates reported in Table 3.3. Its interaction term with the crisis and recovery period dummy is only significant in the specifications controlling for country-pair FE. Contrary to the interaction term with institutional quality, the interaction term with the economic risk rating is significantly positive. This divergence of signs in the post 2008 period provides evidence that the two variables do indeed measure different concepts and each is significant in its own way.[20]

In the next table, I replace the economic risk rating with the financial risk rating and find that financial conditions as measured by the index are not significant when included as level and interaction effect in the pooled specification and the separate reporting and vis-à-vis country FE specification. In the country-pair FE specification, however, the level effect registers positively significant at the 5 percent level in column (5). Once the interaction term is added in column (6), however, the level effect becomes insignificant and even turns signs. The interaction term itself is positive and significant at the 5 percent level suggesting that as the financial risk rating improves within a country so does international bank lending after the onset of the financial crisis. Again, however, the size, sign, and magnitude of the coefficients on the institutional quality variable and its interaction term remain unchanged from the estimations in Table 3.3. This suggests that the financial risk rating and the political risk rating do indeed measure distinct concepts.[21]

Finally, I substitute the composite risk rating for the (political) institutional quality variable in Table 3.15 and examine its effect on international capital flows. The composite risk rating variable is highly significant throughout and positive when included as level effect and negative when included as part of the interaction term. The relative sizes of the coefficients mimic those of the institutional quality variable with the interaction effect about twice as large in absolute size. Given the construction of the composite risk rating – the political risk index is given twice the weight of each of the economic and financial risk rating – this outcome is not too much of a surprise. However, the results for including the

[20]Given that the correlation coefficient between the political risk rating and the economic risk rating is 0.637 multicollinearity might be a concern. In unreported results I regress the economic risk rating on the political risk rating and only included the residual, i.e the part that is not correlated with the political risk rating. The results do not change qualitatively.

[21]Similarly to the multicollinearity concerns regarding the economic risk rating discussed in the previous footnote, multicollinearity might also be of concern with the financial risk rating. Its correlation coefficient with the political risk rating is 0.729. In unreported results I regress the financial risk rating on the political risk rating and only included the residual, that is the part that is not correlated with the political risk rating. As for the economic risk rating, the results do not change qualitatively.

economic and financial risk rating separately have shown that each index measures distinct concepts that affect international bank lending flows differently.

3.5.3 Does it Matter to Which Sector Bank Lending Goes?

Lastly, I exploit the sectoral breakdown of international bank lending provided by the BIS to examine whether institutional quality matters more for lending to some sectors than to others. The sectoral breakdown provided as part of the data series is rather coarse; it only differentiates between lending to the financial sector versus lending to the non-financial sector. The results in Table 3.16 suggest that, compared to lending to all sectors, institutional quality appears to be of lesser consequence when it comes to lending to the non-bank sector in a given vis-à-vis country. While the coefficients are similar in sign and significance – a positive main effect that is overpowered by the negative interaction term in the period after the onset of the financial crisis – their size is only about half as large compared to flows to all sectors. Again, this holds across all specifications.

3.6 Conclusions

This chapter examines the role of institution in promoting international bank lending before and after the global financial crisis of 2008. The results indicate that there appears to be an asymmetric relationship between institutional quality and cross-border bank flows during periods of boom and bust in international bank lending.

Using a panel of bilateral cross-border bank flows to up to 136 countries between 1984 and 2009 the results confirm earlier findings in the literature that better institutions promote cross-border bank lending in the years leading up to the financial crisis. This includes the period of rapidly rising flows from 2003 to 2007, a period that had not yet been studied in this context. The results, however, also indicate that this relationship breaks down during and in the immediate wake of the financial crisis of 2008. The positive relationship disappears in the overall sample, and, driven by flows to high-income, high institutional quality OECD countries, indeed even turns negative. This finding holds across a number of specifications and several robustness tests such as controlling for the cost of the financial crisis or presence of a banking crisis in the reporting and vis-à-vis countries; controlling for non-performing loans as percentage of total loans in the reporting and vis-à-vis countries; controlling for additional macroeconomic variables such as growth rate and interest rate differentials between country-pairs and bilateral exchange rate regimes; and controlling for

indices of economic and financial performance. It is also robust across flows to both the banking and non-banking sector as well as to the exclusion of high-income OECD countries from the sample. Interestingly, the relationship does not completely break down when only considering a sample of emerging markets vis-à-vis countries. Emerging markets countries appear to still hold an advantage in attracting cross-border bank lending flows. However, after the onset of the crisis a better institutional environment only promotes international lending inflows at a quarter of its pre-crisis rate.

The findings are the result of surveying the immediate effects in the crisis and nascent recovery period. By necessity, the results are therefore tentative. As more data becomes available over time it will be worthwhile to examine whether this general break down in the relationship between international capital flows and institutional quality indeed persists or whether there might be an eventual return to the pre-crisis relationship as cross-border banking flows recover.

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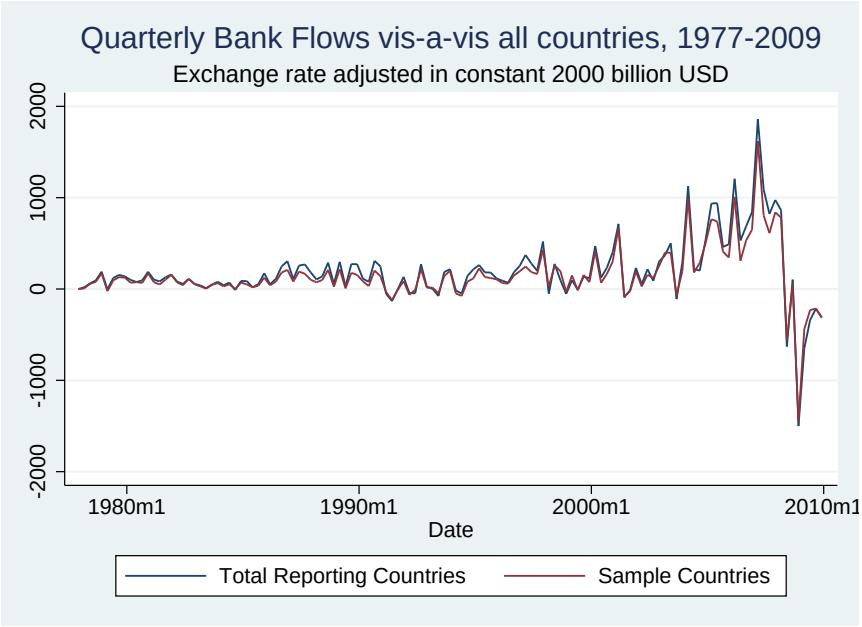
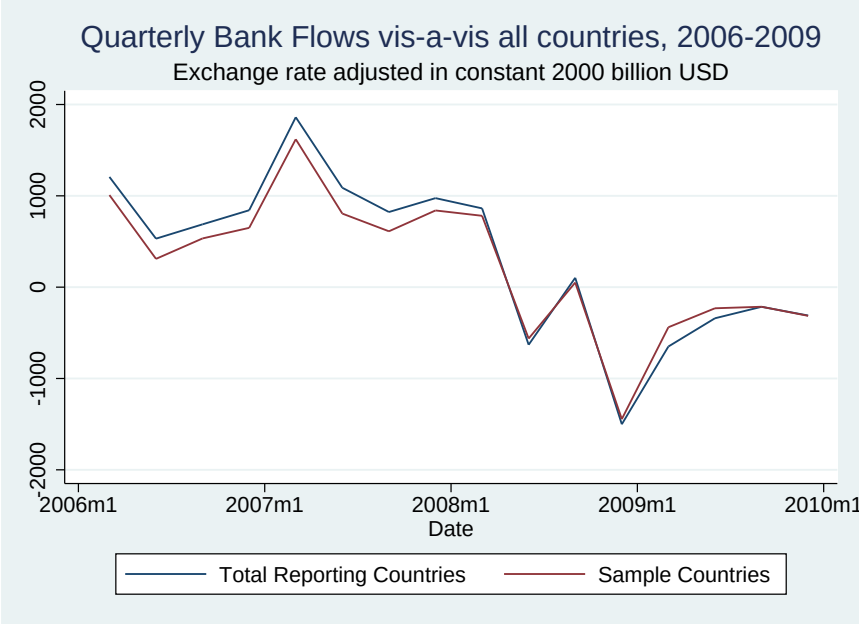
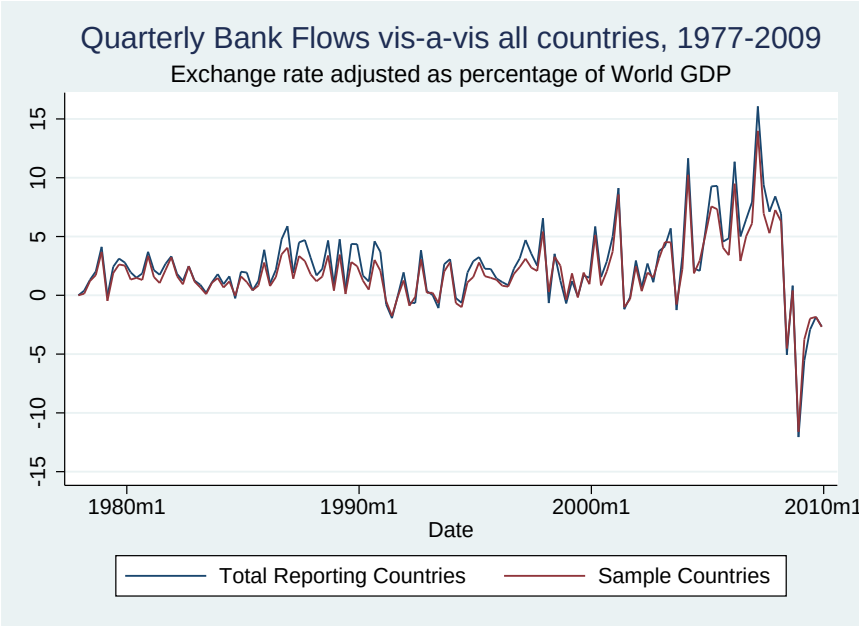


(a) Panel A: 1977 to 2009

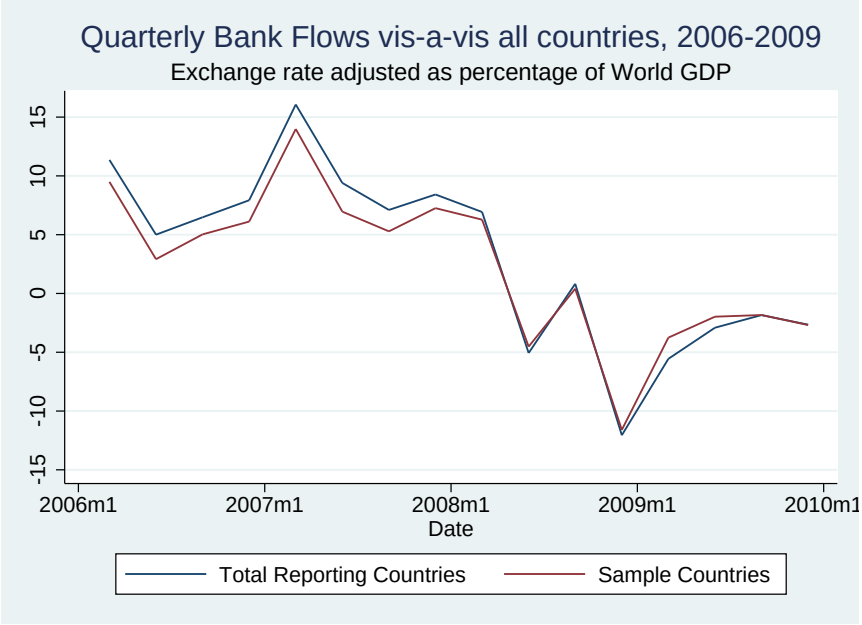


(b) Panel B: 2006 to 2009

Figure 3.1: Quarterly Bank Flows Vis-à-vis All Countries in U.S. Dollars.



(a) Panel A: 1977 to 2009



(b) Panel B: 2006 to 2009

Figure 3.2: Quarterly Bank Flows Vis-à-vis All Countries as Percentage of GDP.

Table 3.1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Bank Flows	182051	85.2787	2328.0	-199165.5	160061.6
Institutional Quality (Political Risk Rating)	182051	65.3125	15.2986	7	97
Economic Risk Rating	182051	34.0724	7.0857	1	50
Financial Risk Rating	182051	34.4888	8.6805	6	50
Composite Risk Rating	182051	66.9791	13.9227	12.5	96
GDP per capita Reporting, (log)	182051	10.0099	0.3088	9.1083	10.6142
GDP per capita Vis-à-vis, (log)	182051	7.9193	1.6195	4.1309	10.9400
Dummy==1 if common language	182051	0.1138	0.3175	0	1
Dummy==1 if colonial ties	182051	0.0573	0.2323	0	1
Distance (log)	182051	8.4495	0.8908	4.0879	9.8826
Dummy==1 if currency union or peg	167435	0.0812	0.2731	0	1
GDP growth rate differential	181623	1.2631	5.7351	-59.4974	104.7162
Real Interest Rate differential	117296	2.3197	25.9056	-109.7255	787.4685

Table 3.2: Correlations

Panel A: All Observations

		1	2	3	4	5	6	7
1	Bank Flows (log)	1.000						
2	Institutional Quality (Political Risk Rating)	0.086***	1.000					
3	Economic Risk Rating	0.072***	0.641***	1.000				
4	Financial Risk Rating	0.068***	0.718***	0.717***	1.000			
5	Composite Risk Rating	0.087***	0.935***	0.829***	0.887***	1.000		
6	GDP per capita Reporting, (log)	0.012***	0.112***	0.135***	0.147***	0.140***	1.000	
7	GDP per capita Vis-à-vis, (log)	0.076***	0.753***	0.633***	0.617***	0.767***	0.033***	1.000
8	Dummy==1 if common language	0.006***	-0.022***	-0.011***	-0.029***	-0.024***	-0.005**	-0.057***
9	Dummy==1 if colonial ties	0.013***	-0.025***	-0.010***	-0.020***	-0.022***	-0.087***	-0.026***
10	Distance (log)	-0.071***	-0.306***	-0.194***	-0.212***	-0.284***	0.067***	-0.302***
11	Dummy==1 if currency union or peg	0.034***	0.155***	0.147***	0.051***	0.137***	-0.003	0.114***
12	GDP growth rate differential	0.018***	0.074***	0.182***	0.168***	0.139***	0.096***	-0.027***
13	Real Interest Rate differential	-0.004	-0.001	-0.035***	0.011***	-0.006**	0.051***	-0.027***

		8	9	10	11	12	13
8	Dummy==1 if common language	1.000					
9	Dummy==1 if colonial ties	0.452***	1.000				
10	Distance (log)	-0.018***	0.018***	1.000			
11	Dummy==1 if currency union or peg	0.059***	0.025***	-0.258***	1.000		
12	GDP growth rate differential	-0.055***	-0.005**	0.031***	-0.025***	1.000	
13	Real Interest Rate differential	0.022***	0.012***	0.063***	-0.007**	-0.059***	1.000

Panel B: Independent Country-Quarter Observations

		1	2	3	4	5	6
1	Bank Flows (log)	1.000					
2	Institutional Quality (Political Risk Rating)	0.245***	1.000				
3	Economic Risk Rating	0.200***	0.637***	1.000			
4	Financial Risk Rating	0.195***	0.729***	0.716***	1.000		
5	Composite Risk Rating	0.246***	0.935***	0.826***	0.893***	1.000	
6	GDP per capita Vis-à-vis, (log)	0.216***	0.748***	0.630***	0.627***	0.765***	1.000

note: *** p<0.01, ** p<0.05, * p<0.1

Table 3.3: Bilateral Quarterly Bank Flows, 1984 to 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GDP per capita Reporting, (log)	0.112***	0.107***	0.103***	0.289**	0.293**	0.299**	0.315**	0.319**	0.325**
	(0.000)	(0.000)	(0.001)	(0.021)	(0.020)	(0.018)	(0.033)	(0.035)	(0.035)
GDP per capita Vis-à-vis, (log)	0.123***	0.029	0.035	0.313**	0.206	0.236*	0.319***	0.211***	0.239***
	(0.000)	(0.187)	(0.115)	(0.040)	(0.141)	(0.095)	(0.000)	(0.003)	(0.001)
Dummy==1 if common language	0.018	0.002	0.002	0.013	0.012	0.012			
	(0.711)	(0.972)	(0.958)	(0.764)	(0.779)	(0.780)			
Dummy==1 if colonial ties	0.237***	0.250***	0.248***	0.189**	0.189**	0.188**			
	(0.009)	(0.006)	(0.006)	(0.017)	(0.017)	(0.017)			
Distance (log)	-0.213***	-0.193***	-0.194***	-0.267***	-0.266***	-0.264***			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
Institutional Quality		0.014***	0.015***		0.015***	0.015***		0.015***	0.015***
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
x post 2008Q2			-0.031***			-0.032***			-0.032***
			(0.000)			(0.000)			(0.000)
Constant	0.144	-0.062	2.107***	-2.035	-2.104	-2.800*	-5.988***	-6.154***	-5.465***
	(0.743)	(0.887)	(0.000)	(0.200)	(0.173)	(0.073)	(0.000)	(0.000)	(0.001)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE				Yes	Yes	Yes			
Vis-à-vis Country FE				Yes	Yes	Yes			
Country-Pair FE							Yes	Yes	Yes
N	182,051	182,051	182,051	182,051	182,051	182,051	182,051	182,051	182,051
# Reporting Countries	18	18	18	18	18	18	18	18	18
# Vis-à-vis Countries	136	136	136	136	136	136	136	136	136
# of Cluster	136	136	136	136	136	136	2,105	2,105	2,105
Adjusted R-squared	0.018	0.019	0.020	0.026	0.026	0.027	0.030	0.030	0.031

Note: *** p<0.01, ** p<0.05, * p<0.1
Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.
Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.4: Bilateral Quarterly Bank Flows with Interaction Effect for Dot-Com Crisis, 1984 to 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GDP per capita Reporting, (log)	0.112***	0.107***	0.103***	0.289**	0.293**	0.299**	0.315**	0.319**	0.326**
	(0.000)	(0.000)	(0.001)	(0.021)	(0.020)	(0.018)	(0.033)	(0.035)	(0.035)
GDP per capita Vis-à-vis, (log)	0.123***	0.029	0.035	0.313**	0.206	0.241*	0.319***	0.211***	0.244***
	(0.000)	(0.187)	(0.114)	(0.040)	(0.141)	(0.092)	(0.000)	(0.003)	(0.001)
Dummy==1 if common language	0.018	0.002	0.003	0.013	0.012	0.012			
	(0.711)	(0.972)	(0.957)	(0.764)	(0.779)	(0.783)			
Dummy==1 if colonial ties	0.237***	0.250***	0.248***	0.189**	0.189**	0.188**			
	(0.009)	(0.006)	(0.006)	(0.017)	(0.017)	(0.017)			
Distance (log)	-0.213***	-0.193***	-0.194***	-0.267***	-0.266***	-0.264***			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
Institutional Quality		0.014***	0.015***		0.015***	0.015***		0.015***	0.015***
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
x 2000Q2 to 2001Q4			-0.002			-0.004			-0.004
			(0.528)			(0.290)			(0.144)
x post 2008Q2			-0.031***			-0.032***			-0.032***
			(0.000)			(0.000)			(0.000)
Constant	0.144	-0.062	2.107***	-2.035	-2.104	-3.076*	-5.988***	-6.154***	-4.322**
	(0.743)	(0.887)	(0.000)	(0.200)	(0.173)	(0.063)	(0.000)	(0.000)	(0.010)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE				Yes	Yes	Yes			
Vis-à-vis Country FE				Yes	Yes	Yes			
Country Pair FE							Yes	Yes	Yes
N	182,051	182,051	182,051	182,051	182,051	182,051	182,051	182,051	182,051
# Reporting Countries	18	18	18	18	18	18	18	18	18
# Vis-à-vis Countries	136	136	136	136	136	136	136	136	136
# of Cluster	136	136	136	136	136	136	2,105	2,105	2,105
Adjusted R-squared	0.018	0.019	0.020	0.026	0.026	0.027	0.030	0.030	0.031

Note: *** p<0.01, ** p<0.05, * p<0.1
Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.
Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.5: Bilateral Quarterly Bank Flows with Cost of 2008 Crisis, 1984 to 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GDP per capita Reporting, (log)	0.109***	0.103***	0.100***	0.438***	0.443***	0.448***	0.463***	0.468***	0.473***
	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.008)	(0.009)	(0.008)
GDP per capita Vis-à-vis, (log)	0.126***	0.031	0.036	0.314**	0.212	0.234	0.318***	0.214***	0.235***
	(0.000)	(0.156)	(0.110)	(0.044)	(0.143)	(0.105)	(0.000)	(0.003)	(0.001)
Dummy==1 if common language	0.021	0.004	0.005	0.013	0.012	0.012			
	(0.679)	(0.932)	(0.914)	(0.760)	(0.775)	(0.779)			
Dummy==1 if colonial ties	0.235***	0.247***	0.246***	0.188**	0.188**	0.188**			
	(0.010)	(0.006)	(0.006)	(0.017)	(0.017)	(0.017)			
Distance (log)	-0.219***	-0.199***	-0.197***	-0.264***	-0.264***	-0.263***			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
Cost of 2008 crisis (% GDP) in Reporting	-0.005***	-0.005***	-0.005***	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***
if quarter $\geqq$ 2008Q2	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cost of 2008 crisis (% GDP) in Vis-à-vis	-0.014***	-0.014***	-0.007**	-0.020***	-0.019***	-0.013***	-0.020***	-0.019***	-0.013***
if quarter $\geqq$ 2008Q2	(0.002)	(0.002)	(0.019)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Institutional Quality		0.014***	0.015***		0.014***	0.014***		0.014***	0.014***
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
x post 2008Q2			-0.027***			-0.025***			-0.025***
			(0.000)			(0.000)			(0.000)
Constant	0.208	0.001	2.068***	-3.601**	-3.673**	-4.253**	-7.191***	-7.364***	-6.911***
	(0.636)	(0.998)	(0.000)	(0.039)	(0.031)	(0.013)	(0.000)	(0.000)	(0.000)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE				Yes	Yes	Yes			
Vis-à-vis Country FE				Yes	Yes	Yes			
Country-Pair FE							Yes	Yes	Yes
N	182,051	182,051	182,051	182,051	182,051	182,051	182,051	182,051	182,051
# Reporting Countries	18	18	18	18	18	18	18	18	18
# Vis-à-vis Countries	136	136	136	136	136	136	136	136	136
# of Cluster	136	136	136	136	136	136	2,105	2,105	2,105
Adjusted R-squared	0.018	0.019	0.020	0.027	0.027	0.028	0.031	0.031	0.032

Note: *** p<0.01, ** p<0.05, * p<0.1
Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.
Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.6: Bilateral Quarterly Bank Flows with 2008 Banking Crisis Dummy, 1984 to 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GDP per capita Reporting, (log)	0.105***	0.100***	0.098***	0.344***	0.348***	0.352***	0.373**	0.377**	0.381**
	(0.000)	(0.001)	(0.001)	(0.008)	(0.007)	(0.007)	(0.016)	(0.017)	(0.017)
GDP per capita Vis-à-vis, (log)	0.128***	0.034	0.037	0.294*	0.196	0.215	0.298***	0.198***	0.217***
	(0.000)	(0.136)	(0.106)	(0.053)	(0.166)	(0.129)	(0.000)	(0.005)	(0.002)
Dummy==1 if common language	0.016	-0.000	0.001	0.013	0.012	0.012			
	(0.742)	(0.995)	(0.991)	(0.765)	(0.779)	(0.780)			
Dummy==1 if colonial ties	0.240***	0.253***	0.252***	0.188**	0.188**	0.188**			
	(0.009)	(0.005)	(0.005)	(0.017)	(0.017)	(0.017)			
Distance (log)	-0.225***	-0.205***	-0.202***	-0.262***	-0.262***	-0.261***			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
Dummy==1 if banking crisis in Reporting if quarter $\geqq$ 2008Q2	-1.013***	-1.018***	-0.707***	-1.359***	-1.311***	-1.040***	-1.359***	-1.313***	-1.040***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Dummy==1 if banking crisis in Vis-à-vis if quarter $\geqq$ 2008Q2	-0.266***	-0.264***	-0.265***	-0.327***	-0.330***	-0.332***	-0.338***	-0.340***	-0.342***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Institutional Quality		0.014***	0.015***		0.013***	0.014***		0.014***	0.014***
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
x post 2008Q2			-0.022***			-0.018***			-0.018***
			(0.000)			(0.000)			(0.000)
Constant	0.272	0.064	1.918***	-2.132	-2.288	-3.196**	-5.939***	-6.106***	-5.119***
	(0.540)	(0.884)	(0.000)	(0.202)	(0.158)	(0.042)	(0.000)	(0.000)	(0.003)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE				Yes	Yes	Yes			
Vis-à-vis Country FE				Yes	Yes	Yes			
Country Pair FE							Yes	Yes	Yes
N	182,051	182,051	182,051	182,051	182,051	182,051	182,051	182,051	182,051
# Reporting Countries	18	18	18	18	18	18	18	18	18
# Vis-à-vis Countries	136	136	136	136	136	136	136	136	136
# of Cluster	136	136	136	136	136	136	2,105	2,105	2,105
Adjusted R-squared	0.019	0.020	0.020	0.027	0.028	0.028	0.031	0.032	0.032

Note: *** p<0.01, ** p<0.05, * p<0.1
Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.
Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.7: Bilateral Quarterly Bank Flows with Controls for Percentage of Non-Performing Loans, 2005 to 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GDP per capita Reporting, (log)	0.523***	0.526***	0.521***	4.931***	4.925***	5.297***	4.945**	4.941**	5.310**
	(0.000)	(0.000)	(0.000)	(0.008)	(0.008)	(0.004)	(0.024)	(0.025)	(0.016)
GDP per capita Vis--vis, (log)	0.095**	-0.013	-0.015	7.114***	6.985***	5.103***	7.251***	7.135***	5.320***
	(0.028)	(0.827)	(0.802)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Dummy==1 if common language	-0.014	-0.023	-0.023	0.024	0.024	0.023			
	(0.909)	(0.845)	(0.842)	(0.842)	(0.841)	(0.849)			
Dummy==1 if colonial ties	0.934***	0.949***	0.950***	0.707***	0.707***	0.708***			
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)			
Distance (log)	-0.253***	-0.225***	-0.221***	-0.443***	-0.443***	-0.446***			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
% NPL Reporting	0.057***	0.057***	0.057***	0.067*	0.067*	0.071**	0.063	0.063	0.067
	(0.005)	(0.005)	(0.006)	(0.056)	(0.056)	(0.046)	(0.145)	(0.146)	(0.123)
% NPL Vis--vis	-0.032***	-0.031***	-0.028***	-0.034**	-0.033**	-0.031**	-0.035***	-0.034***	-0.032***
	(0.000)	(0.000)	(0.003)	(0.012)	(0.017)	(0.047)	(0.000)	(0.000)	(0.001)
Institutional Quality		0.018***	0.038***		0.018	0.042		0.016	0.039*
		(0.010)	(0.000)		(0.576)	(0.176)		(0.439)	(0.061)
x post 2008Q2			-0.051***			-0.036***			-0.035***
			(0.000)			(0.000)			(0.000)
Constant	-2.981***	-3.619***	-1.519	-119.013***	-119.224***	-104.502***	-113.222***	-113.339***	-100.486***
	(0.007)	(0.001)	(0.185)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE				Yes	Yes	Yes			
Vis--vis Country FE				Yes	Yes	Yes			
Country Pair FE							Yes	Yes	Yes
N	25,844	25,844	25,844	25,844	25,844	25,844	25,844	25,844	25,844
# Reporting Countries	18	18	18	18	18	18	18	18	18
# Vis--vis Countries	89	89	89	89	89	89	89	89	89
# of Cluster	89	89	89	89	89	89	1,438	1,438	1,438
Adjusted R-squared	0.041	0.041	0.045	0.057	0.057	0.058	0.056	0.056	0.058

Note: *** p<0.01, ** p<0.05, * p<0.1
Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.
Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.8: Bilateral Quarterly Bank Flows with Additional Controls, 1984 to 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GDP per capita Reporting, (log)	0.088*	0.084*	0.084*	0.711***	0.698***	0.691***	0.881***	0.865***	0.858***
	(0.054)	(0.072)	(0.071)	(0.000)	(0.000)	(0.000)	(0.001)	(0.002)	(0.002)
GDP per capita Vis-à-vis, (log)	0.145***	0.026	0.029	0.303	0.164	0.159	0.306***	0.163	0.156
	(0.000)	(0.334)	(0.297)	(0.109)	(0.327)	(0.340)	(0.003)	(0.115)	(0.131)
Dummy==1 if common language	0.046	0.034	0.036	-0.002	-0.002	0.000			
	(0.453)	(0.551)	(0.528)	(0.973)	(0.968)	(0.995)			
Dummy==1 if colonial ties	0.219**	0.234**	0.233**	0.208**	0.209**	0.208**			
	(0.040)	(0.027)	(0.027)	(0.024)	(0.024)	(0.025)			
Distance (log)	-0.172***	-0.146***	-0.144***	-0.216***	-0.215***	-0.212***			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
Dummy==1 if currency union or peg	0.159	0.167	0.171	0.112	0.114	0.117	0.243**	0.249**	0.256**
	(0.236)	(0.199)	(0.188)	(0.292)	(0.282)	(0.271)	(0.018)	(0.015)	(0.012)
GDP growth rate differential	0.009	0.005	0.005	0.009	0.006	0.005	0.009***	0.005**	0.005*
	(0.208)	(0.426)	(0.482)	(0.212)	(0.418)	(0.475)	(0.001)	(0.037)	(0.072)
Real Interest Rate differential	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.000
	(0.613)	(0.725)	(0.791)	(0.709)	(0.890)	(0.968)	(0.772)	(0.988)	(0.938)
Institutional Quality		0.018***	0.018***		0.017***	0.017***		0.017***	0.018***
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
x post 2008Q2			-0.033***			-0.034***			-0.035***
			(0.004)			(0.004)			(0.000)
Constant	-1.911***	-2.292***	-0.535	-8.146***	-8.013***	-4.782**	-11.289***	-11.143***	-10.640***
	(0.004)	(0.000)	(0.394)	(0.000)	(0.000)	(0.020)	(0.000)	(0.000)	(0.000)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE				Yes	Yes	Yes			
Vis-à-vis Country FE				Yes	Yes	Yes			
Country-Pair FE							Yes	Yes	Yes
N	110,100	110,100	110,100	110,100	110,100	110,100	110,100	110,100	110,100
# Reporting Countries	18	18	18	18	18	18	18	18	18
# Vis-à-vis Countries	126	126	126	126	126	126	126	126	126
# of Cluster	126	126	126	126	126	126	1,867	1,867	1,867
Adjusted R-squared	0.016	0.017	0.018	0.025	0.026	0.027	0.028	0.029	0.029

Note: *** p<0.01, ** p<0.05, * p<0.1
Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.
Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.9: Pre-Crisis Bilateral Quarterly Bank Flows, 1984 to 2007

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GDP per capita Reporting, (log)	0.157***	0.151***	0.157***	0.477***	0.481***	0.467***	0.502***	0.506***	0.487***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.009)	(0.009)	(0.009)
GDP per capita Vis-à-vis, (log)	0.138***	0.047*	0.035	0.342**	0.249	0.108	0.351***	0.256***	0.114
	(0.000)	(0.054)	(0.140)	(0.032)	(0.100)	(0.451)	(0.000)	(0.001)	(0.147)
Dummy==1 if common language	0.022	0.006	0.009	0.006	0.005	0.006			
	(0.666)	(0.895)	(0.856)	(0.903)	(0.912)	(0.894)			
Dummy==1 if colonial ties	0.216**	0.228**	0.228**	0.154*	0.154*	0.154*			
	(0.022)	(0.014)	(0.015)	(0.053)	(0.053)	(0.053)			
Distance (log)	-0.235***	-0.215***	-0.214***	-0.280***	-0.279***	-0.283***			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
Institutional Quality		0.013***	0.011***		0.012***	0.012***		0.012***	0.012***
		(0.000)	(0.000)		(0.001)	(0.001)		(0.000)	(0.000)
x post 2008Q2			0.017***			0.019***			0.019***
			(0.000)			(0.000)			(0.000)
Constant	-0.488	-0.682	-0.527	-5.268**	-5.161**	-3.865**	-7.059***	-7.180***	-6.498***
	(0.322)	(0.166)	(0.285)	(0.012)	(0.011)	(0.048)	(0.001)	(0.001)	(0.001)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE				Yes	Yes	Yes			
Vis-à-vis Country FE				Yes	Yes	Yes			
Country-Pair FE							Yes	Yes	Yes
N	166,326	166,326	166,326	166,326	166,326	166,326	166,326	166,326	166,326
# Reporting Countries	18	18	18	18	18	18	18	18	18
# Vis-à-vis Countries	136	136	136	136	136	136	136	136	136
# of Cluster	136	136	136	136	136	136	2,105	2,105	2,105
Adjusted R-squared	0.017	0.018	0.019	0.028	0.028	0.029	0.033	0.033	0.034

Note: *** p<0.01, ** p<0.05, * p<0.1
Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.
Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.10: Post-Crisis Bilateral Quarterly Bank Flows, 2008Q1 to 2009

	(1)	(2)	(3)
GDP per capita Reporting, (log)	-0.539***	-3.688	-3.492
	(0.000)	(0.191)	(0.330)
GDP per capita Vis-à-vis, (log)	-0.188***	7.881***	7.934***
	(0.000)	(0.000)	(0.000)
Dummy==1 if common language	-0.103	0.057	
	(0.316)	(0.624)	
Dummy==1 if colonial ties	0.347**	0.412**	
	(0.045)	(0.035)	
Distance (log)	0.097	0.020	
	(0.112)	(0.844)	
Institutional Quality	0.050***	0.058	0.058
	(0.000)	(0.218)	(0.152)
x 2008Q3	-0.022**	-0.023**	-0.023*
	(0.049)	(0.042)	(0.056)
x 2008Q4	-0.076***	-0.078***	-0.078***
	(0.000)	(0.000)	(0.000)
x 2009Q1	-0.048***	-0.035**	-0.035***
	(0.001)	(0.021)	(0.005)
x 2009Q2	-0.024**	-0.011	-0.011
	(0.016)	(0.268)	(0.386)
x 2009Q3	-0.031**	-0.019	-0.018
	(0.010)	(0.146)	(0.145)
x 2009Q4	-0.058***	-0.046***	-0.045***
	(0.000)	(0.003)	(0.000)
Constant	3.500***	-43.194	-32.727
	(0.007)	(0.197)	(0.413)
Time FE	Yes	Yes	Yes
Reporting Country FE		Yes	
Vis-à-vis Country FE		Yes	
Country-Pair FE			Yes
N	13,770	13,770	13,770
# Reporting Countries	18	18	18
# Vis-à-vis Countries	135	135	135
# of Cluster	135	135	2,021
Adjusted R-squared	0.029	0.041	0.011

Note: *** p<0.01, ** p<0.05, * p<0.1

Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.

Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.11: Bilateral Quarterly Bank Flows Excluding High-Income OECD Vis-à-vis Countries, 1984 to 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GDP per capita Reporting, (log)	0.047*	0.048*	0.048*	-0.018	-0.016	-0.015	-0.028	-0.026	-0.025
	(0.077)	(0.073)	(0.074)	(0.842)	(0.857)	(0.872)	(0.765)	(0.778)	(0.792)
GDP per capita Vis-à-vis, (log)	0.051***	-0.001	0.000	0.088	-0.025	-0.006	0.091	-0.025	-0.006
	(0.000)	(0.948)	(0.983)	(0.449)	(0.807)	(0.950)	(0.174)	(0.711)	(0.928)
Dummy==1 if common language	-0.053	-0.060*	-0.060*	0.013	0.012	0.013			
	(0.124)	(0.071)	(0.073)	(0.676)	(0.689)	(0.684)			
Dummy==1 if colonial ties	0.102*	0.106*	0.106*	0.110*	0.110*	0.110*			
	(0.064)	(0.052)	(0.052)	(0.063)	(0.062)	(0.063)			
Distance (log)	-0.114***	-0.116***	-0.117***	-0.216***	-0.218***	-0.218***			
	(0.004)	(0.003)	(0.002)	(0.000)	(0.000)	(0.000)			
Institutional Quality		0.010***	0.011***		0.013***	0.014***		0.014***	0.014***
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
x post 2008Q2			-0.012***			-0.014***			-0.014***
			(0.002)			(0.000)			(0.000)
Constant	0.222	0.116	0.088	1.821*	1.965**	1.771*	-0.217	-0.211	-0.120
	(0.547)	(0.753)	(0.813)	(0.083)	(0.050)	(0.075)	(0.836)	(0.842)	(0.910)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE				Yes	Yes	Yes			
Vis-à-vis Country FE				Yes	Yes	Yes			
Country-Pair FE							Yes	Yes	Yes
N	136,435	136,435	136,435	136,435	136,435	136,435	136,435	136,435	136,435
# Reporting Countries	18	18	18	18	18	18	18	18	18
# Vis-à-vis Countries	106	106	106	106	106	106	106	106	106
# of Cluster	106	106	106	106	106	106	1,590	1,590	1,590
Adjusted R-squared	0.011	0.012	0.012	0.017	0.018	0.018	0.020	0.021	0.021

Note: *** p<0.01, ** p<0.05, * p<0.1
Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.
Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.12: Bilateral Quarterly Bank Flows to 33 Emerging Countries, 1984 to 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GDP per capita Reporting, (log)	0.040	0.037	0.037	0.085	0.088	0.088	0.028	0.031	0.031
	(0.359)	(0.405)	(0.408)	(0.702)	(0.690)	(0.691)	(0.902)	(0.893)	(0.895)
GDP per capita Vis-à-vis, (log)	0.031	-0.044	-0.042	0.090	0.041	0.062	0.103	0.053	0.075
	(0.474)	(0.387)	(0.410)	(0.814)	(0.899)	(0.849)	(0.517)	(0.721)	(0.621)
Dummy==1 if common language	-0.070	-0.028	-0.029	0.089	0.094	0.094			
	(0.515)	(0.782)	(0.774)	(0.267)	(0.241)	(0.243)			
Dummy==1 if colonial ties	0.242**	0.238**	0.239**	0.206*	0.206*	0.206*			
	(0.029)	(0.035)	(0.034)	(0.093)	(0.094)	(0.093)			
Distance (log)	-0.184***	-0.162***	-0.163***	-0.221***	-0.222***	-0.222***			
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)			
Institutional Quality		0.017***	0.017***		0.021***	0.021***		0.021***	0.021***
		(0.001)	(0.001)		(0.008)	(0.006)		(0.000)	(0.000)
x post 2008Q2			-0.012*			-0.014**			-0.014**
			(0.086)			(0.044)			(0.019)
Constant	1.471**	0.724	0.684	0.830	-0.267	-0.490	-0.775	-1.764	-1.392
	(0.043)	(0.267)	(0.303)	(0.835)	(0.940)	(0.892)	(0.771)	(0.506)	(0.601)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE				Yes	Yes	Yes			
Vis-à-vis Country FE				Yes	Yes	Yes			
Country-Pair FE							Yes	Yes	Yes
N	49,559	49,559	49,559	49,559	49,559	49,559	49,559	49,559	49,559
# Reporting Countries	18	18	18	18	18	18	18	18	18
# Vis-à-vis Countries	33	33	33	33	33	33	33	33	33
# of Cluster	33	33	33	33	33	33	550	550	550
Adjusted R-squared	0.022	0.024	0.024	0.029	0.030	0.030	0.031	0.032	0.032

Note: *** p<0.01, ** p<0.05, * p<0.1
Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.
Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.13: Bilateral Quarterly Bank Flows, Adding Economic Institutions, 1984 to 2009

	(1)	(2)	(3)	(4)	(5)	(6)
GDP per capita Reporting, (log)	0.107***	0.104***	0.298**	0.302**	0.325**	0.329**
	(0.000)	(0.000)	(0.018)	(0.017)	(0.034)	(0.035)
GDP per capita Vis-à-vis, (log)	0.016	0.026	0.168	0.206	0.171**	0.209***
	(0.517)	(0.311)	(0.235)	(0.152)	(0.016)	(0.004)
Dummy==1 if common language	-0.002	-0.000	0.012	0.012		
	(0.970)	(0.996)	(0.778)	(0.779)		
Dummy==1 if colonial ties	0.250***	0.249***	0.188**	0.188**		
	(0.006)	(0.006)	(0.017)	(0.017)		
Distance (log)	-0.194***	-0.195***	-0.266***	-0.264***		
	(0.000)	(0.000)	(0.000)	(0.000)		
Institutional Quality (Political)	0.013***	0.015***	0.013***	0.014***	0.013***	0.014***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Economic Risk Rating	0.007*	0.004	0.012***	0.008*	0.012***	0.008***
	(0.078)	(0.253)	(0.004)	(0.058)	(0.000)	(0.000)
x post 2008Q2 (Political)		-0.032***		-0.033***		-0.033***
		(0.000)		(0.000)		(0.000)
x post 2008Q2 (Economic)		0.009		0.014		0.014**
		(0.307)		(0.124)		(0.022)
Constant	-0.111	1.804***	-2.122	-2.743*	-6.175***	-5.490***
	(0.800)	(0.001)	(0.174)	(0.080)	(0.000)	(0.001)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE			Yes	Yes		
Vis-à-vis Country FE			Yes	Yes		
Country-Pair FE					Yes	Yes
N	182,051	182,051	182,051	182,051	182,051	182,051
# Reporting Countries	18	18	18	18	18	18
# Vis-à-vis Countries	136	136	136	136	136	136
# of Cluster	136	136	136	136	2,105	2,105
Adjusted R-squared	0.019	0.020	0.027	0.027	0.031	0.031

Note: *** p<0.01, ** p<0.05, * p<0.1

Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.

Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.14: Bilateral Quarterly Bank Flows, Adding Financial Institutions, 1984 to 2009

	(1)	(2)	(3)	(4)	(5)	(6)
GDP per capita Reporting, (log)	0.106***	0.103***	0.296**	0.298**	0.323**	0.324**
	(0.000)	(0.001)	(0.019)	(0.018)	(0.035)	(0.035)
GDP per capita Vis-à-vis, (log)	0.024	0.036	0.201	0.226	0.205***	0.230***
	(0.295)	(0.134)	(0.163)	(0.109)	(0.004)	(0.001)
Dummy==1 if common language	0.002	0.002	0.012	0.012		
	(0.968)	(0.962)	(0.778)	(0.779)		
Dummy==1 if colonial ties	0.249***	0.248***	0.189**	0.188**		
	(0.006)	(0.006)	(0.017)	(0.017)		
Distance (log)	-0.194***	-0.194***	-0.265***	-0.264***		
	(0.000)	(0.000)	(0.000)	(0.000)		
Institutional Quality (Political)	0.013***	0.016***	0.013***	0.015***	0.013***	0.016***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Financial Risk Rating	0.003	-0.001	0.005	-0.001	0.005**	-0.002
	(0.366)	(0.743)	(0.187)	(0.775)	(0.017)	(0.474)
x post 2008Q2 (Political)		-0.032***		-0.033***		-0.033***
		(0.000)		(0.000)		(0.000)
x post 2008Q2 (Financial)		0.007		0.013		0.014**
		(0.542)		(0.264)		(0.035)
Constant	-0.058	1.898***	-2.140	-2.683*	-6.225***	-5.358***
	(0.895)	(0.001)	(0.170)	(0.083)	(0.000)	(0.002)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE			Yes	Yes		
Vis-à-vis Country FE			Yes	Yes		
Country-Pair FE					Yes	Yes
N	182,051	182,051	182,051	182,051	182,051	182,051
# Reporting Countries	18	18	18	18	18	18
# Vis-à-vis Countries	136	136	136	136	136	136
# of Cluster	136	136	136	136	2,105	2,105
Adjusted R-squared	0.019	0.020	0.026	0.027	0.030	0.031

Note: *** p<0.01, ** p<0.05, * p<0.1

Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.

Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.15: Bilateral Quarterly Bank Flows, Composite Risk Index, 1984 to 2009

	(1)	(2)	(3)	(4)	(5)	(6)
GDP per capita Reporting, (log)	0.107***	0.105***	0.301**	0.302**	0.328**	0.330**
	(0.000)	(0.000)	(0.017)	(0.017)	(0.035)	(0.035)
GDP per capita Vis-à-vis, (log)	0.024	0.033	0.186	0.226	0.189***	0.229***
	(0.336)	(0.215)	(0.217)	(0.130)	(0.009)	(0.002)
Dummy==1 if common language	0.002	0.004	0.012	0.012		
	(0.971)	(0.939)	(0.775)	(0.777)		
Dummy==1 if colonial ties	0.247***	0.245***	0.188**	0.188**		
	(0.006)	(0.007)	(0.017)	(0.018)		
Distance (log)	-0.200***	-0.199***	-0.264***	-0.263***		
	(0.000)	(0.000)	(0.000)	(0.000)		
Composite Risk Rating	0.016***	0.016***	0.017***	0.017***	0.017***	0.017***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
x post 2008Q2		-0.032***		-0.030***		-0.030***
		(0.000)		(0.000)		(0.000)
Constant	-0.066	2.202***	-2.166	-2.858*	-6.266***	-5.610***
	(0.882)	(0.000)	(0.172)	(0.075)	(0.000)	(0.001)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE			Yes	Yes		
Vis-à-vis Country FE			Yes	Yes		
Country-Pair FE					Yes	Yes
N	182,051	182,051	182,051	182,051	182,051	182,051
# Reporting Countries	18	18	18	18	18	18
# Vis-à-vis Countries	136	136	136	136	136	136
# of Cluster	136	136	136	136	2,105	2,105
Adjusted R-squared	0.019	0.019	0.027	0.027	0.030	0.031

Note: *** p<0.01, ** p<0.05, * p<0.1

Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.

Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.16: Bilateral Quarterly Bank Flows to the Non-Bank Sector, 1984 to 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GDP per capita Reporting, (log)	0.115***	0.113***	0.111***	0.089	0.093	0.099	0.102	0.105	0.113
	(0.000)	(0.000)	(0.000)	(0.445)	(0.430)	(0.401)	(0.440)	(0.426)	(0.400)
GDP per capita Vis-à-vis, (log)	0.097***	0.052***	0.056***	0.279**	0.252**	0.268**	0.290***	0.262***	0.277***
	(0.000)	(0.005)	(0.004)	(0.016)	(0.030)	(0.023)	(0.000)	(0.000)	(0.000)
Dummy==1 if common language	-0.026	-0.032	-0.032	-0.009	-0.009	-0.009			
	(0.493)	(0.391)	(0.391)	(0.783)	(0.783)	(0.778)			
Dummy==1 if colonial ties	0.184**	0.188**	0.188**	0.156**	0.156**	0.156**			
	(0.020)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)			
Distance (log)	-0.152***	-0.143***	-0.143***	-0.161***	-0.161***	-0.159***			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
Institutional Quality		0.007***	0.007***		0.004	0.004		0.004***	0.004***
		(0.001)	(0.000)		(0.108)	(0.104)		(0.004)	(0.004)
x post 2008Q2			-0.016***			-0.017***			-0.017***
			(0.000)			(0.000)			(0.000)
Constant	-0.432	-0.535	-0.678	-2.015	-2.027	-0.872	-3.503**	-3.578**	-3.295**
	(0.333)	(0.233)	(0.137)	(0.239)	(0.229)	(0.606)	(0.017)	(0.015)	(0.026)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reporting Country FE				Yes	Yes	Yes			
Vis-à-vis Country FE				Yes	Yes	Yes			
Country-Pair FE							Yes	Yes	Yes
N	174,811	174,811	174,811	174,811	174,811	174,811	174,811	174,811	174,811
# Reporting Countries	18	18	18	18	18	18	18	18	18
# Vis-à-vis Countries	136	136	136	136	136	136	136	136	136
# of Cluster	136	136	136	136	136	136	2,021	2,021	2,021
Adjusted R-squared	0.013	0.014	0.014	0.022	0.023	0.023	0.029	0.029	0.029

Note: *** p<0.01, ** p<0.05, * p<0.1
Dependent variable is log of quarterly bank flows in log of mio of constant 2000 US$.
Errors clustered at vis-a-vis country-level for (1) to (6) and the countrypair-level in (6) to (9). P-values reported in parentheses.

Table 3.A: BIS Sample Reporting Countries

	Reporting Country	First Reporting Year
1	Australia	1997
2	Austria	1987
3	Belgium	1977
4	Denmark	1977
5	Finland	1983
6	France	1977
7	Germany	1977
8	Greece	2003
9	Ireland	1977
10	Italy	1977
11	Japan	1977
12	Netherlands	1977
13	Portugal	1997
14	Spain	1983
15	Sweden	1977
16	Switzerland	1977
17	United Kingdom	1977
18	United States	1977

Table 3.B: ICRG Risk Rating Methodology

Political Risk Rating
The rating ranges in value from 0 to 100 with higher value indicating better institutional quality (or lower political risk). It is constructed from the following 12 variables with the number in parenthesis indicating the maximal number of points that can be achieved per variable: (1) Government Stability, which rates government unity, legislative strength, and popular support (12); (2) Socioeconomic Conditions, which rates unemployment, consumer confidence, and poverty (12); (3) Investment Profile, which rates contract viability/expropriation, profits repatriation, and payment delays (12); (4) Internal Conflict, which rates civil war/coup threat, terrorism/political violence, and civil disorder (12); (5) External Conflicts, which rates war, cross-border conflict, and foreign pressures (12); (6) Corruption (6); (7) Military in Politics (6); (8) Religious Tensions (6); (9) Law and Order (6); (10) Ethnic Tensions (6); (11) Democratic Accountability (6); (12) Bureaucracy Quality (6).

Economic Risk Rating
The rating ranges in value from 0 to 50 with higher value indicating better institutional quality (or lower economic risk). It is constructed from the following 5 variables with the number in parenthesis indicating the maximal number of points that can be achieved per variable: (1) GDP per capita (5); (2) Real GDP Growth (10); (3) Annual Inflation Rate (10); (4) Budget Balance as Percentage of GDP (10); (5) Current Account as Percentage of GDP (15).

Financial Risk Rating
The rating ranges in value from 0 to 50 with higher value indicating better institutional quality (or lower financial risk). It is constructed from the following 5 variables with the number in parenthesis indicating the maximal number of points that can be achieved per variable: (1) Foreign Debt as Percentage of GDP (10); (2) Foreign Debt Service as Percentage of Exports of Goods and Services (10); (3) Current Account as a Percentage of Exports of Goods and Services (15); (4) Net International Liquidity as Month of Import Cover (10); (5) Exchange Rate Stability (10).

Source: PRS, "International Country Risk Guide Methodology."

Table 3.C: Variable Definitions

Variable Name	Definition	Frequency	Source
Bank flows	Bilateral bank flows from Reporting to Vis-à-vis country, exchange rate adjusted in 2008 constant U.S. dollars from the Locational Banking Statistics series	Quarterly	BIS
Common language	Dummy==1 if country-pair shares a common official language	Time invariant	CEPII
Colonial ties	Dummy==1 if country-pair shares a common official language	Time invariant	CEPII
Distance (log)	Great circle distance between the capital of two countries	Time invariant	CEPII
Currency union or peg	Dummy==1 if country pair is part of a currency union or have a defacto peg of their currency.	Monthly	Ilzetzki, Reinhart and Rogoff, 2008 Klein and Shambaugh, 2006
GDP per capita (log)	GDP per capita in 2008 constant U.S. dollars (log)	Annual	WDI
GDP growth rate differential	Difference between GDP growth rate in percentage points between Vis-à-vis and Reporting country	Annual	WDI
Real Interest Rate differential	Difference between real interest rate in percentage points between Vis-à-vis and Reporting country	Annual	WDI
Institutional Quality (Political Risk Rating)	Ranges from 0 to 100. See Appendix A.2 for details.	Monthly	PRS
Economic Risk Rating	Ranges from 0 to 50. See Appendix A.2 for details.	Monthly	PRS
Financial Risk Rating	Ranges from 0 to 50. See Appendix A.2 for details.	Monthly	PRS
Composite Risk Rating	Ranges from 0 to 100. See Appendix A.2 for details.	Monthly	PRS
Cost of 2008 crisis (% GDP)	Cost of 2008 crisis computed as the cumulative difference between actual and trend real GDP, expressed as a percentage of trend real GDP for the period [T, T+3] where T is the starting year of the crisis. Trend real GDP is computed by applying an HP filter (=100) to the GDP series over [T-20, T-1]. Variable set to 0 if no outputloss recorded.	Time invariant	Laeven and Valencia, 2010

Chapter 4

Is Small Beautiful? Financial Structure, Size and Access to Finance[1]

[1]This chapter is based on joint work with Thorsten Beck (Tilburg University and CEPR) and Asli Demirgüç-Kunt (The World Bank). A version of this chapter has been published as World Bank Policy Research Working Paper 5806. We are grateful for comments from participants at the World Bank conference on Financial Structure, especially our discussant Jung Wan, Sergio Schmukler as well as from three anonymous referees.

4.1 Introduction

The structure of the financial system is again in the headlines. Moving beyond the questions of banks vs. markets, policy makers are looking for advice on which kind of financial institutions and which market structures serve best in pushing out the access frontier. Which institutions are best suited to expand financial services to low-end customers, including small and medium-sized enterprises (SMEs)? Are these banks which can exploit scale and technological capacity, or specialized lenders, such as leasing or factoring companies, which can offer expertise in tailored lending products, or low-end financial institutions such as credit unions which are closest to customers? Similarly, are small or large financial institutions better in serving low-end customers? On the one hand, large institutions can exploit scale economies and better diversify risks; on the other hand, small institutions might have better local market knowledge and flatter hierarchies, both of which facilitate serving low-end customers.

Combining two unique data sets, this chapter explores the relationship between financial structure and access to finance. We capture financial structure in two ways. We consider the importance of different financial institutions – including low-end financial institutions, specialized lenders and banks – by calculating their asset share relative to total assets and the average size of these institutions. Firms' access to financial services is measured by account and lending services. In addition, we explore the potential heterogeneity of these relationships both across countries at different levels of economic development, across industries with different needs for external finance and across firms of different sizes. This allows us to take into account the different needs and capacities of countries in supporting different financial structures, different constraints of firms of different sizes and different needs for external finance across different industries.

The relationship between financial structure and access to finance is a critical question for policy makers. Access to financial services, especially by SMEs, has become critical in many developing countries. SMEs make up a large part of the emerging private sector in most countries, but are also more constrained in their access to financial services than large firms (Ayyagari, Beck and Demirgüç-Kunt, 2007; Beck, Demirgüç-Kunt and Maksimovic, 2005). While micro-finance has helped alleviate access to finance by the poor by adopting specific lending techniques such as group lending, it seems less conducive to easing financing constraints of more formal and larger enterprises. More recently, specific financing forms such as leasing or factoring have been promoted as conducive to easing financing constraints of SMEs, as they are based on the underlying assets and cash flows rather than borrowers'

financial history (Berger and Udell, 2006). On the other hand, banks, particularly large banks, have also shown increased interest in SME financing, exploiting scale economies and technology (Beck, Demirgüç-Kunt and Martinez Peria, 2011a). The question on the size of financial institutions – often intertwined with the ownership question – is directly related to entry barriers and minimum capital requirements imposed by policy makers in developing countries to foster a specific market structure (Beck et al., 2011b; Beck et al., 2011c and World Bank, 2011).

This chapter uses a unique dataset to shed light on the relationship between the structure of the financial system and the size of its institutions, on the one hand, and access to financial services by enterprises, on the other hand. Specifically, using data from the World Bank and IMF's Financial Sector Assessment Program (FSAP), we are able to compute both the relative importance of different segments of the financial system that cater to low-end customers, such as SMEs, as well as the average size of institutions within this segment. We then match these country-level indicators to firm-level indicators from the World Bank's Enterprise Surveys on actual use of deposit and loan services by enterprises in developing and emerging countries. In addition, we examine the relationship between financial structure and firms' access to finance across countries at different levels of GDP per capita, across firms of different sizes, and across industries with different needs of external finance, to thus take explicitly into account the potential cross-county, cross-firm and cross-industry heterogeneity in the effect of financial structure on firms' access to finance.

Our research speaks to several literatures. First, the financial structure literature has discussed the implications of bank- vs. market-based financial systems for firm, industry and GDP per capita growth,[2] but has not considered the importance of other segments of the financial system, including specialized lenders such as leasing, finance or factoring companies or low-end financial institutions such as cooperatives, credit unions and microfinance institutions. This chapter is the first, to our knowledge, that explores the relationship between the importance of these two segments focused on SME lending for access to finance by enterprises. Theory and literature offer different predictions on the effect of importance of these segments on firms' access to finance. On the one hand, specialized lenders can exploit their expertise in specific lending products such as leasing and factoring to improve firms' access to external finance. Similarly, low-end financial institutions might have an advantage in working with smaller and less formal enterprises than banks, as they are

[2]For the relationship between the degree to which a country is bank- or market-based and firm, industry and GDP per capita growth, see Demirgüç-Kunt and Maksimovic (2002), Beck and Levine (2002) and Levine (2002), respectively.

closer to the client and might have more adequate organizational structures, such as flat hierarchies, and lending techniques, such as group lending.[3] On the other hand, banks have a larger scale and technical capacity to cater to a large number of low-end clients (De la Torre, Martinez Peria and Schmukler, 2010). They might be therefore in a better position to invest in technology and risk management systems than other financial institutions.

Second, our research speaks to a large literature on the effects of the size of financial institutions on firms' access to financial services (Berger, Hasan and Klapper, 2004). This literature has focused mostly on the size of banks, but has not come to an unambiguous result. On the one hand, smaller banks might be closer to the client and can use relationship lending to effectively serve small and medium-sized enterprises. On the other hand, larger banks might have an advantage in using transaction-based lending techniques such as leasing or factoring. While this literature has focused on banks, we expand it to consider the relationship between the average size of low-end financial institutions, specialized lenders and access to finance by enterprises. Similar arguments as for banks can be made for non-bank institutions. On the one hand, smaller institutions might be closer to the client; on the other hand, larger institutions might serve these clients more effectively by exploiting their scale.

Our results suggest that the dominance by banks in most financial systems of developing markets is associated with a lower use of financial services by firms of all sizes. A larger share of low-end financial institutions and specialized lenders, on the other hand, is associated with higher use of financial services in low-income and lower middle-income, but not necessarily in upper middle-income countries. Large financial institutions, on the other hand, are not necessarily associated with lower use of financial services. To the contrary, larger specialized lenders and larger banks might actually ease small firms' financing constraints, while large low-end financial institutions seem to impede access to financial institutions only for medium-sized and large enterprises. And larger low-end financial institutions might actually be better in easing access to finance in low-income countries.

Before proceeding, an important caveat is due. Our results derive from cross-sectional variation across countries and although we control for an array of firm and country characteristics, we can therefore not completely exclude the possibility of omitted variable bias. We mitigate this concern, however, by testing for the differential relationship between financial structure and average size of financial institutions, on the one hand, and access to external finance by firms in countries at different levels of GDP per capita, firms of

[3]See Armendariz and Morduch (2005) for a survey.

different sizes and firms in industries with different financing needs. It is important to stress, however, that we do not interpret our findings as causal relationships.

The remainder of the chapter is structured as follows. The next section discusses the data sources and variables we use. Section 4.3 presents methodology and section 4.4 our results. Section 4.5 concludes.

4.2 Data

We use data from two main sources to construct our sample. We use the Financial Sector Assessment Program (FSAP) reports, which are jointly prepared by the IMF and World Bank,[4] to construct our measures of the importance or asset share and average size of different segments of the financial system. We use firm-level data from the World Bank's Enterprise Surveys to construct measures of firms' access to and use of financial services. Since there is limited overlap between the two datasets, we end up with a total of 54 sample countries and up to 50 countries per regression. All our countries are developing or emerging countries, with 19 countries in Europe and Central Asia, 10 countries in Latin America, 23 countries in Sub-Saharan Africa, and 2 countries in East Asia and Pacific. The level of economic development, as measured by GDP per capita (in constant 2000 US$), varies significantly across our sample countries, ranging from US$ 134 in Malawi to US$ 7,229 in Uruguay.

Established in 1999, the FSAP is a comprehensive and in-depth analysis of a country's financial sector. Historically, full FSAP updates take place about every four to seven years in any given country. Among other things, the reports generally include a table that reports on the country's financial structure broken down into institutional categories such as banks, insurance companies or pension funds. The aggregation level of institutional categories varies across reports. There is no standardized categorization of institutions; while one report may have "banks" as one institutional category, another report may have "private banks" and "state-owned banks" as institutional categories instead, which combined would be equivalent to the category "banks" in the former report. The table typically provides the following information for each institutional category: number of institutions, assets in (mostly) local currency units, assets as a percentage of total financial sector assets and assets as percentage of GDP. Note that not all reports provide data in all four categories

[4]To be exact, FSAP is a joint undertaking of the World Bank and the IMF in developing and emerging market countries and of the IMF alone in advanced economies.

and while reports generally include a couple of years of historical data they may record data in one category for one year but not the next and often data just for one or two years are reported.[5] Using this financial structure information, we build a database from all financial structure information reported in table form in FSAP reports from the beginning of the program until mid-2009.

For some countries, more than one FSAP report is available. Unfortunately, the reporting structure is almost never the same as in the previous report(s) for the same country and cross-checks of the data revealed that the reported information is not even necessarily consistent across reports for the same country. We therefore assume that the most recent report contains the most accurate information and only keep observations from the most recent report available. Our final database consists of an unbalanced panel for 89 countries over the years 1995-2008. We convert any variables in local currency units into 2000 constant U.S. dollars using exchange rates from the IMF's International Financial Statistics.

While we have data available for a broader array of institutions, we focus on three types. First, low-end financial institutions (*low-end NBFIs*) which include credit unions, building societies, community banks, cooperatives, micro-finance institutions, cash lenders, mutual banks, postal banks, rural banks, savings and loans institutions, and thrift banks. This category is supposed to capture non-bank institutions that serve the low-end of the market, including SMEs. Second, specialized non-bank financial institutions (*specialized NBFIs*) which comprise – among others – finance companies, factoring companies, banks specialized in housing, merchant banks, and special credit institutions. This category is supposed to capture non-bank financial institutions that specialize in certain lending activities that might be more attractive for SMEs, such as leasing and factoring. The final category is deposit-taking or commercial banks (*banks*).[6]

We use the FSAP data to construct two indicators. The asset share is calculated as each type's assets relative to the sum of low-end financial institutions, specialized non-bank financial institutions and commercial bank financial assets and gauges the importance of each segment within the financial system. The three asset shares add up to 100.[7] The

[5]See Appendix Table 4.A below for data availability across countries and categories.

[6]We carefully screen and group institutions into those three categories as applicable to arrive at comparable institutional categories across countries.We believe that by focusing on those three aggregate categories (as opposed to more detailed categories) we can best construct comparable categories across countries despite potential regulatory differences. Furthermore, by focusing on developing countries we also minimize regulatory differences.

[7]There are other categories such as insurance companies or pension funds that we do not include in

average size is computed by dividing the total amount of assets per category by the number of institutions per category.

Both indicators vary widely across our sample countries. The share of banks varies from almost 99 percent in Ukraine to 61 percent in Colombia. The share of specialized lenders varies from 38 percent in Colombia to less than one percent in Senegal, Ukraine, Bolivia, and Madagascar. The share of low-end financial institutions varies from 21 percent in Burkina Faso to less than one-half percent in Chile and Latvia. The average size of banks in ranges from US$ 3.5 billion in Turkey to US$ 10 million in Guinea-Bissau. The average size of specialized lenders varies from US$ 350 million in Chile to less than US$ 1 million in Mongolia. The average size of low-end financial institutions varies from US$ 800 million in Turkey to less than US$ 1 million in Mongolia.

We combine the financial structure data with data from the World Bank's Enterprise Surveys. The Enterprise Surveys collect firm level-data from key manufacturing and service sectors in over 120 countries since 2002.[8] Countries are surveyed every three to four years but not simultaneously. To ensure data consistency and inter-country comparability we only use data from countries in the standardized dataset 2006-2010 which contains data for 100 countries.[9] The number of firms surveyed in each country depends on the size of the economy with more firms being surveyed in larger economies and is chosen to make each country's sample representative of the non-agricultural private economy.

From the Enterprise Surveys we construct three access to and use of financial services indicators: (i) *account* is a dummy variable equal to one if the firm has an account at the time of the survey and zero otherwise; (ii) *overdraft* is a dummy variable equal to one if the firm has an overdraft facility at the time of the survey and zero otherwise; and (iii) *loan* is a dummy variable equal to one if the firm has a line of credit or loan from a financial institution at the time of survey and zero otherwise.

We match the two samples by building a cross-sectional dataset that matches the firm characteristics with the average of the available data from the FSAP reports. Maximum country overlap between the two data sources is 54 countries with over 25,000 firm level observations. Appendix Table 4.A lists the countries in our sample, a breakdown of the firm distribution by country, and by-country summary statistics of the FSAP variables we will use in the subsequent analysis. Table 4.1 provides descriptive statistics and Table 4.2

our analysis.

[8]Only private sector firms are surveyed; fully state-owned firms are excluded.

[9]Due to changes in the questionnaire data from the earlier years cannot be easily compared to data collected in the more recent years. In the six instances where multiple years of data are available for a given country, we keep only the most recent year of data.

correlations on the country level.

The descriptive statistics in Table 4.1 show that over 90 percent of firms in our sample have an account. This percentage, however, varies significantly across countries. While in the Slovak Republic 20.8 percent of firms have an account, 99.8 percent do so in Croatia.[10] Almost 50 percent of firms have an overdraft facility and 45 percent have a loan. Behind this average, however, are again large cross-country variations. While only 1.3 percent of firms have an overdraft facility and 3.1 percent a loan in Guinea-Bissau, 87.5 percent and 74.5 percent, respectively, do so in Chile.

We also use information from the Enterprise Surveys to control for firm-level characteristics that might affect a firm's ease of access to financial products. In particular, we construct dummy variables for firm size (small, up to 19 employees; medium, 20-99 employees; large, 100 or more employees), being a subsidiary, and being publicly listed, and control for the percentage of the firm owned by private foreign owners and the percentage of a firm owned by the state, as well as the firm's age. The descriptive statistics in Table 4.1 show that 47.4 percent of all firms are small, 34.3 percent are medium-sized and 18.3 percent large. 13 percent are subsidiaries of other firms, and 6.2 percent are publicly listed. The foreign ownership share is, on average, 10.7 percent, while the average government ownership is 0.7 percent. On average, firms are 17.5 years old.

We control for the level of development and the depth of the financial sector using the logarithm of GDP per capita and credit to the private sector as percentage of GDP, respectively. The data come from the World Bank's World Development Indicators. The rationale for including credit to the private sector as control is that, beyond the general level of development, financial structure might be a function of the depth of the financial sector. The average depth of the financial sector in our sample is 25.6 percent, ranging from just over 2 percent in Guinea-Bissau to 80.3 percent in Chile.

Finally, we control for industry-level variation in the need for external finance. Specifically, we use the Rajan and Zingales (1998) indicator on the fraction of investment that cannot be financed through internal cash flows, computed over the 1980s for listed firms in the United States. The underlying assumption in Rajan and Zingales and our work is that for technological reasons some industries depend more heavily on external finance than others and that this industry variation does not differ across countries. We use the self-reported industry categorization by firms in the Enterprise Surveys to match with the Rajan and Zingales classification. Since this variable is only available for manufacturing

[10] Our regression results are robust to the exclusion of the Slovak Republic.

industries, we lose about a half of our sample. The average fraction of external need for finance across our sample is 0.29, varying from -0.45 (tobacco) to 1.14 (plastic products).

The correlations in Table 4.2 suggest that there is no systematic relationship between the country-level metrics of financial segment size. Not surprisingly, however, the average asset size variables of some of the institutional categories are positively and significantly correlated. The depth of the financial system as measured by private credit as percentage of GDP is, as expected, positively and significantly correlated with the mean asset size of all institutional categories except low-end NBFIs. There are no significant correlations between the asset shares of the different segments of the financial system and our access to finance variables. There are, however, significant correlations between the average size of financial institutions and the access to finance variables. Countries with larger specialized lenders and larger banks have a higher share of firms with overdraft facilities and loans. There are also significant positive correlations between the depth of the financial system and all three measures of access to finance. Many of the firm characteristics are also correlated with each other. Countries with more small firms, for instance, have younger and fewer listed firms. Lastly, our access indicators are also significantly correlated with our industry indicator of external dependence, with firms in industries more reliant on external finance being more likely to have an account, a loan or an overdraft.

4.3 Methodology

To estimate the effect of the mean asset size and assets as share of total assets of different types of financial institutions on the use of financial services we use the following empirical baseline specification:

$$\begin{aligned} \text{Financial Services}_{ij} = \alpha \quad &+ \quad \beta_1 \text{ Medium Firm}_{ij} + \beta_2 \text{ Large Firm}_{ij} + \beta_3 \text{ Subsidiary}_{ij} \\ &+ \quad \beta_4 \text{ Publicly Listed}_{ij} + \beta_5 \text{ Foreign-Owned}_{ij} \\ &+ \quad \beta_6 \text{ State-Owned}_{ij} + \beta_7 \text{ Firm Age}_{ij} + \beta_8 \text{ Firm Sector}_{ij} \\ &+ \quad \beta_9 \text{ GDP per Capita}_{j} + \beta_{10} \text{ Private Credit}_{j} \\ &+ \quad \beta_{11} \text{ Financial Sector Indicator}_{j} + \epsilon_{ij} \end{aligned} \tag{4.1}$$

where *Financial Services* indicates one of our three dependent variables measuring the use of financial services of firm i in country j. Because of the binary nature of the dependent variables we use a probit model to estimate the specification. *Financial Sector Indicator* is

our independent variable of interest that varies across regressions: average size or assets as share of financial sector assets per the institutional categories low-end financial institutions, specialized lenders, and banks. Standard errors are clustered at the country level in all specifications so that we allow for correlation of error terms across firms within a country but not across countries. It is important to note that our regressions imply empirical associations, but not necessarily causality.

In a second step, we want to assess whether the relationship between financial structure and access to financial services varies across countries with different levels of economic development, across firms of different sizes and across industries with different needs for external finance. We therefore interact, in separate regressions, the financial sector indicator with GDP per capita, with dummy variables indicating that the firm is small, medium or large size, or with the Rajan and Zingales (1998) indicator of external dependence. In the case of interactions with size dummies, we do not include the financial sector indicator by itself, while in the case of interaction regressions with external dependence we include both external dependence and its interaction with the financial sector indicator. Since Ai and Norton (2003) have shown that it might be difficult to interpret the marginal effects of interaction terms in non-linear models, we run these regressions with OLS.

4.4 Results

Tables 4.3 and 4.6 report our main results using asset share and average size as financial sector indicators, respectively, while Tables 4.4 and 4.5 and Tables 4.7 and 4.8 report the regressions with interaction terms. Tables 4.4 and 4.7 each report the coefficient estimates, while Tables 4.5 and 4.8 report the partial effects of those coefficient estimates at the 25th, 50th and 75th percentiles of GDP per capita and the external dependence ratio. In the interest of space and readability, we report regression coefficients of all variables in Table 4.3, while in all subsequent tables we report just the coefficients of interest, namely the coefficients of the Financial Sector Indicator and interaction terms. Due to data limitations on the average size variables the country sample and the number of firms do not stay constant across specifications in Tables 4.6 to 4.8.[11]

[11]The dependent variables in Tables 4.3 to 4.5 allow for a balanced panel across countries by construction.

4.4.1 Asset Share Across Different Segments

The results in Table 4.3 suggest that there is no significant relationship between the importance of low-end financial institutions and firms' access to financial services. However, we find that firms in countries with a larger share of specialized lenders are more likely to have an overdraft and a loan, and these relationships are significant at the 5 percent level. We also find that a larger share of banks in total financial assets is associated with lower use of financial services by enterprises. The share of bank assets in total financial assets enters negatively and significantly at the 10 percent level in the regression of account and overdraft and negatively and significantly at the 1 percent level in the regression of loans. Overall, the results thus suggest that specialized lenders are an especially important segment in the financial system when it comes to providing access to credit for firms.

The coefficient estimates on our control variables are largely as expected and hold across the three categories of financial institutions. Firms in countries with higher GDP per capita as well as medium and large firms are more likely to have an account, overdraft facility, and loan. In more financially developed countries firms are more likely to have an account and loan, however this holds only for the regressions controlling for the share of specialized lenders and banks. Firms that are subsidiaries are more likely to have an account and an overdraft facility, while there appears to be no significant relationship between a firm being publicly listed and its use of financial services. As the percentage of foreign ownership in a firm increases firms are more likely to have an account. However, they are also less likely to have a loan. Firms are also less likely to have a loan as the percentage of state ownership in a firm increases suggesting that in both cases alternative financing options might be available to such firms. Finally, the older firms are the more likely they are to have an account and overdraft facility.

The results of Table 4.4 show that our results from above largely hold once we interact the asset shares with level of economic development, level of external dependence and firm size even though there is some variation in significance across countries with different levels of GDP per capita and firms of different size. The interactions with GDP per capita show that the relationship between the importance of low-end financial institutions, specialized lenders and banks varies significantly across countries with different levels of economic development. While the asset share of low-end financial institutions enters positively and significantly in the regressions of account and overdraft, its interaction with GDP per capita enters negatively and significantly. When we calculate the partial effects (Table 4.5) for the share of low-end financial institutions at the 25th, 50th, and 75th percentile of

GDP per capita (equivalent to the GDP per capita of Mongolia, Guatemala, and Brazil, respectively) in our sample we find that only the relation between the share of low-end financial institutions and having an account or loan at the 25th percentile of GDP per capita is significant and positive, while the relation between the share of low-end financial institutions and the share of firms with overdraft is not significant at any level of GDP per capita. Thus only in low-income countries do firms benefit – in terms of better access to financial services – from a higher share of low-end financial institutions. Neither the level of the share of specialized financial institutions nor its interaction with GDP per capita enters significantly. The partial effects calculations in Table 4.5 suggest that the importance of specialized financial institutions only has a statistically significant impact in the case of overdrafts and loans for countries at the 50th percentile of GDP per capita where the impact is significant and positive. They also have a positive and significant impact on account for countries at the 75th percentile. Finally, the relationship between banks' importance and firms' use of overdrafts and loans is negative and significant only in countries at the 25th and 50th percentile of GDP per capita. The relationship between banks' importance and firms' use of accounts is also negative and significant at the 50th percentile of GDP, but somewhat surprisingly not at the 25th percentile. The negative effect of bank dominance is thus concentrated in low and lower-middle income countries.

When interacting the relative importance of different segments of the financial system with the external dependence across different sectors, none of the interaction terms enter significantly. While the partial effects calculations suggest some significant relationships, the relation between the relative size of different segments of the financial system and access to finance by enterprises generally does not vary across sectors with different needs for external finance. However, there is one exception: a more prominent role of low-end financial institutions helps firms that rely less on external finance to obtain loans with the relationship turning insignificant at the 75th percentile of external dependence.

When interacting the financial sector indicators with firm size dummies, we cannot find any significant relationship between the relative importance of low-end financial institutions and access to finance and no differential effect across firms of different sizes, with one exception. Specifically, the likelihood of having an account increases with a higher share of low-end financial institutions for medium and large firms, while none of the other firm-size interactions enters significantly at the 5 percent level. In the case of specialized lenders, we find that a more prominent role is associated with a higher likelihood of obtaining an overdraft facility or loan for small and medium-sized firms while the relationship is not

significant for large firms. At the same time, a more prominent role of banks is associated with the opposite effect, that is, a lower likelihood of obtaining an overdraft facility or loan for small and medium-sized firms, and again an insignificant effect for large firms.

4.4.2 Average Size of Financial Institutions

The regressions in Table 4.6 suggest that smaller low-end financial institutions are associated with a higher probability of firms having an account. On the other hand, having larger specialized lenders is associated with a higher probability of having an overdraft facility and loan. The average size of banks is not associated with access to finance.

The coefficient estimates in the regressions reported in Tables 4.7 and 4.8 show a non-linear relationship between the average size of different financial institutions and access to finance across countries at different levels of GDP per capita, across firms of different sizes, and across different external financing needs. Overall, they suggest that larger low-end and specialized financial institutions are better at providing especially firms in countries with low levels of development with access to credit. The message on the relationship between the size of financial institutions and firms' access to financial services is thus nuanced: it is larger institutions within the segment of the financial system that is traditionally thought of to be closer to the client – either because of their organizational structure or specialized products – that ease access to finance. At the same time, larger specialized financial institutions and banks are related to better financial access for small firms.

In particular, larger low-end financial institutions are associated with a higher likelihood of use of an overdraft facility and loans across countries although the partial effects diminish as the GDP per capita increases. While the coefficient on average size enters positively and significantly, its interaction enters negatively and significantly in the regressions of overdrafts and loans. Assessing the partial effects, we find that the average size of low-end institutions has a positive relationship with the likelihood of having an overdraft at all levels of GDP per capita, but decreasingly so as we move up the ladder of economic development and indeed turning insignificant for countries at the 75th percentile of GDP. We do not find any significant relationship between the average size of low-end institutions and the likelihood of having an account at any level of GDP per capita. The interaction regressions with the external dependence variable are not significant implying that there is no differential effect of the average size of low-end lenders in term of GDP per capita across industries with different external financing needs. The negative relationship of the average size of low-end financial institutions with the use of accounts holds across firms of

all sizes, though it is strongest for small enterprises.

A larger average size of specialized lenders continues to be positively associated with the likelihood of having an overdraft or loan across all countries, while there is no significant relation with the use of accounts. This positive relationship holds for firms of all sizes and is strongest for small firms, with the exception of being insignificant for large firms in the loan column. The partial effects calculations for the external dependence ratio suggest that there is no differential effect of the average size of specialized lenders across industries with different external financing needs.

Larger banks are associated with a positive relation of average size of banks with the likelihood of having an account at the 25th and 50th percentiles of GDP per capita, but not at the 75th percentile. We also find evidence that larger banks are associated with a higher likelihood of overdrafts and loans for small firms. The interaction with external finance is significant at the 5 percent level for likelihood of having an account and an overdraft facility. However, when combined with the level effect we see from the results in Table 4.8 that the overall effect of banks is insignificant across the different percentiles of the external dependence ratio.

4.4.3 Robustness Tests

In unreported robustness tests, we gauge the sensitivity of the interaction regressions of Tables 4.4 and 4.5 and Tables 4.7 and 4.8 to the estimation technique. Specifically, we find that our main findings hold when using non-linear estimation techniques as in Tables 4.3 and 4.6. We also test for the robustness of our results in Table 4.6 using a constant country sample of 29 to confirm that our results are not driven by varying country samples across the three institutional categories.

4.5 Conclusion

Using unique data on the financial structure and the average size of different financial institutions, this chapter explores the implications of the relative importance and average size of institutions that cater specifically to SMEs compared to the importance of banks and their average size.

Our results indicate that the dominance of banks in the financial systems of most developing countries appears to be rather detrimental for firms' access to financial services. We do not find any evidence that smaller institutions – be they banks, specialized lenders

or low-end financial institutions – are better in providing access to finance for enterprises. Critically, however, we find that "one size does not fit all." Low-end financial institutions and specialized lenders seem especially appropriate to ease access to finance in low-income countries. Similarly, larger low-end financial institutions and banks seem to ease access to finance only at low levels of GDP per capita. We also find variation across firm sizes, not so much in the importance of different segments of the financial system, but rather in the relationship with the average size. We do not find that larger low-end financial institutions hurt small firms' access to credit. Even more important, larger specialized lenders and banks are actually associated with a greater likelihood of loan and overdraft use by small firms. We do not find that some of our effects are stronger for industries more reliant on external finance.

Our results, while tentative, send important policy messages. First, the dominance of banks in most financial systems across the developing world is indeed associated with the limited access to financial services by enterprises. This calls for diversification and more competition within the financial system, including from low-end financial institutions and specialized lenders. Second, smaller financial institutions are not necessarily better equipped to improve access to financial services by enterprises. While certainly not a call for consolidation, this again implies a diversified financial system with institutions of different sizes.

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Table 4.1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
A. Firm-level Characteristics					
Dummy==1 if firm has account	24531	0.9044	0.2940	0	1
Dummy==1 if firm has overdraft facility	23952	0.4891	0.4999	0	1
Dummy==1 if firm has loan	24336	0.4474	0.4972	0	1
Dummy==1 if firm size small	24659	0.4742	0.4993	0	1
Dummy==1 if firm size medium	24659	0.3426	0.4746	0	1
Dummy==1 if firm size large	24659	0.1831	0.3868	0	1
Dummy==1 if subsidiary	24659	0.1305	0.3368	0	1
Dummy==1 if publicly listed	24659	0.0575	0.2327	0	1
% of firm owned by foreign investor	24659	10.7282	29.1665	0	100
% of firm owned by government	24659	0.7362	6.9009	0	100
Firm age in years	24659	17.5148	16.0739	0	310
B. Industry-level Characteristics					
External dependence ratio	28	0.2871	0.3680	-0.45	1.14
C. Country-level Characteristics					
GDP per capita (log)	54	6.9650	1.2173	4.8947	8.8859
Private Credit (% GDP)	54	25.6340	17.4473	2.0892	80.3032
Mean asset size, low-end NBFI (in constant 2000 bn US$)	36	0.0322	0.1357	0.0000	0.8175
Mean asset size, specialized NBFI (in constant 2000 bn US$)	33	0.0578	0.0903	0.0004	0.3555
Mean asset size, banks (in constant 2000 bn US$)	50	0.5419	0.7633	0.0099	3.4644
Asset share, low-end NBFI (%)	33	4.3890	5.2283	0.0564	21.7718
Asset share, specialized NBFI (%)	33	6.5246	7.5962	0.2727	38.0821
Asset share, banks (%)	33	89.0864	8.5655	61.1734	98.8938

Table 4.2: Correlations

		1	2	3	4	5	6	7	8	9	10
1	Account	1.000									
2	Overdraft facility	0.344**	1.000								
3	Loan	0.345**	0.673***	1.000							
4	Dummy==1 if firm size small	-0.267*	-0.440***	-0.710***	1.000						
5	Dummy==1 if firm size medium	0.248*	0.437***	0.627***	-0.888***	1.000					
6	Dummy==1 if firm size large	0.234*	0.359***	0.652***	-0.913***	0.623***	1.000				
7	Dummy==1 if subsidiary	0.276**	0.160	-0.112	-0.118	0.059	0.150	1.000			
8	Dummy==1 if publicly listed	0.045	-0.027	0.205	-0.384***	0.382***	0.314**	-0.077	1.000		
9	% of firm owned by foreign investor	0.124	-0.139	-0.372***	0.089	-0.076	-0.085	0.644***	-0.131	1.000	.
10	% of firm owned by government	0.030	-0.125	0.061	-0.131	-0.001	0.225	0.083	0.418***	-0.009	1.000
11	Firm age in years	0.302**	0.604***	0.628***	-0.516***	0.508***	0.426***	0.160	0.144	-0.116	-0.019
12	External dependence ratio	0.278**	0.407***	0.383***	-0.520***	0.408***	0.522***	0.198	0.097	0.024	0.022
13	Private Credit	0.270**	0.326**	0.579***	-0.419***	0.277**	0.467***	0.099	-0.033	-0.201	-0.117
14	GDP per capita (log)	0.176	0.416***	0.649***	-0.496***	0.359***	0.525***	0.123	-0.004	-0.041	0.022
15	Asset share, low-end NBFI	0.158	0.032	-0.070	0.018	0.030	-0.056	0.038	-0.014	0.032	-0.009
16	Asset share, specialized NBFI	-0.035	0.186	0.109	0.200	-0.078	-0.265	-0.228	-0.274	-0.064	0.021
17	Asset share, banks	-0.065	-0.184	-0.054	-0.188	0.051	0.270	0.179	0.252	0.037	-0.013
18	Mean asset size, low-end NBFI	-0.020	0.227	0.195	-0.242	0.143	0.253	-0.091	-0.141	-0.183	-0.141
19	Mean asset size, specialized NBFI	0.198	0.536***	0.428**	-0.040	0.185	-0.078	0.066	-0.191	-0.178	-0.310*
20	Mean asset size, banks	0.056	0.467***	0.481***	-0.413***	0.288**	0.435***	0.121	-0.193	-0.183	-0.113

		11	12	13	14	15	16	17	18	19	20
12	External dependence ratio	0.348***	1.000								
13	Private Credit	0.360***	0.392***	1.000							
14	GDP per capita (log)	0.409***	0.427***	0.658***	1.000						
15	Asset share, low-end NBFI	0.070	0.078	-0.101	-0.267	1.000					
16	Asset share, specialized NBFI	-0.124	-0.034	-0.134	0.158	-0.147	1.000				
17	Asset share, banks	0.068	-0.017	0.181	0.023	-0.480***	-0.797***	1.000			
18	Mean asset size, low-end NBFI	0.085	0.130	-0.026	0.232	-0.088	-0.051	0.105	1.000		
19	Mean asset size, specialized NBFI	0.352**	0.137	0.401**	0.502***	-0.311	0.575***	-0.302	-0.035	1.000	
20	Mean asset size, banks	0.354**	0.440***	0.402***	0.634***	-0.196	0.070	0.070	0.592***	0.506***	1.000

Notes: *** p<0.01, ** p<0.05, * p<0.1
Correlations are at the country-level with firm-level variables averaged by country.

Table 4.3: Asset Shares and Access to Finance

	Account	**Overdraft**	**Loan**	**Account**	**Overdraft**	**Loan**	**Account**	**Overdraft**	**Loan**
	probit	probit	probit	probit	probit	probit	probit	probit	probit
	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se
Dummy==1 if firm size medium	0.468***	0.505***	0.502***	0.477***	0.525***	0.515***	0.480***	0.518***	0.513***
	(0.066)	(0.058)	(0.038)	(0.068)	(0.059)	(0.038)	(0.064)	(0.062)	(0.038)
Dummy==1 if firm size large	0.595***	0.718***	0.845***	0.605***	0.749***	0.863***	0.615***	0.742***	0.865***
	(0.116)	(0.100)	(0.063)	(0.118)	(0.101)	(0.062)	(0.112)	(0.103)	(0.063)
Dummy==1 if subsidiary	0.181*	0.185***	0.018	0.192**	0.200***	0.029	0.195**	0.199***	0.030
	(0.095)	(0.065)	(0.045)	(0.094)	(0.062)	(0.043)	(0.094)	(0.063)	(0.043)
Dummy==1 if publicly listed	-0.041	-0.031	0.109	-0.034	-0.000	0.124	-0.024	0.001	0.131*
	(0.102)	(0.086)	(0.075)	(0.098)	(0.088)	(0.079)	(0.099)	(0.088)	(0.073)
% of firm owned by foreign investor	0.003***	-0.001	-0.004***	0.003***	-0.001	-0.004***	0.003***	-0.001	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
% of firm owned by government	0.001	-0.002	-0.006***	-0.000	-0.003	-0.007***	0.000	-0.003	-0.007***
	(0.004)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)
Firm age in years	0.004***	0.005***	0.001	0.005***	0.006***	0.001	0.005***	0.005***	0.001
	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
GDP per capita (log)	0.129	0.369***	0.317***	0.071	0.292***	0.252***	0.077	0.336***	0.273***
	(0.098)	(0.093)	(0.065)	(0.092)	(0.097)	(0.062)	(0.086)	(0.092)	(0.056)
Private Credit	0.005	-0.001	0.004	0.008*	0.003	0.007**	0.008*	0.002	0.006**
	(0.005)	(0.006)	(0.003)	(0.005)	(0.006)	(0.003)	(0.004)	(0.006)	(0.003)
NBFI, low-end	0.023	0.007	0.013						
	(0.016)	(0.018)	(0.008)						
NBFI, specialized				0.008	0.020**	0.011**			
				(0.008)	(0.009)	(0.005)			
Banks							-0.013*	-0.017*	-0.013***
							(0.007)	(0.009)	(0.004)
Constant	3.086***	-8.254***	1.290**	3.496***	-7.665***	1.765***	4.758***	-6.385***	2.851***
	(0.770)	(0.592)	(0.521)	(0.815)	(0.761)	(0.485)	(0.952)	(1.236)	(0.576)
N	17,879	17,542	17,686	17,879	17,542	17,686	17,879	17,542	17,686
# countries	33	33	33	33	33	33	33	33	33
Pseudo Adj. R-squared	0.085	0.131	0.126	0.081	0.140	0.127	0.085	0.140	0.129

Notes: *** p<0.01, ** p<0.05, * p<0.1
Regressions include unreported industry dummies. Errors are clustered at the country level.
Source: Authors' analysis based on data from FSAP reports, Enterprise Surveys, and WDI as described in the text.

Table 4.4: Asset Share and Access to Finance – Cross-Country and Cross-Firm Heterogeneity

	Account			**Overdraft**			**Loan**		
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se
NBFI, low-end	0.026**	0.003		0.096***	0.002		0.029	0.008**	
	(0.010)	(0.003)		(0.037)	(0.007)		(0.023)	(0.003)	
x GDP per capita (log)	-0.003**			-0.014**		-0.004			
	(0.002)			(0.006)			(0.004)		
x External Dependence		-0.001			-0.012			-0.007	
		(0.002)			(0.010)			(0.005)	
NBFI, low-end x small			0.004			0.002			0.005*
			(0.003)			(0.006)			(0.003)
NBFI, low-end x medium			0.004*			0.001			0.003
			(0.002)			(0.008)			(0.003)
NBFI, low-end x large			0.005**			0.006			0.005
			(0.002)			(0.009)			(0.004)
N	17,883	10,166	17,883	17,544	9,973	17,544	17,690	10,050	17,690
# countries	33	33	33	33	33	33	33	33	33
Adj. R-squared	0.050	0.039	0.048	0.182	0.174	0.169	0.162	0.156	0.161
NBFI, specialized	-0.016	0.001		0.009	0.007***		0.015	0.005***	
	(0.011)	(0.001)		(0.026)	(0.002)		(0.019)	(0.001)	
x GDP per capita (log)	0.002			-0.000			-0.001		
	(0.001)			(0.003)			(0.002)		
x External Dependence		0.001			0.000			0.000	
		(0.002)			(0.004)			(0.002)	
NBFI, specialized x small			0.001			0.007***			0.004*
			(0.002)			(0.003)			(0.002)
NBFI, specialized x medium			0.001			0.007**			0.005***
			(0.001)			(0.003)			(0.002)
NBFI, specialized x large			0.001*			0.002			0.002
			(0.001)			(0.004)			(0.002)
N	17,883	10,166	17,883	17,544	9,973	17,544	17,690	10,050	17,690
# countries	33	33	33	33	33	33	33	33	33
Adj. R-squared	0.046	0.039	0.044	0.179	0.187	0.180	0.164	0.159	0.164
Banks	-0.004	-0.002*		-0.024	-0.007***		-0.017	-0.006***	
	(0.010)	(0.001)		(0.019)	(0.002)		(0.012)	(0.001)	
x GDP per capita (log)	0.000			0.002			0.002		
	(0.001)			(0.003)			(0.002)		
x External Dependence		-0.001			0.006			0.003	
		(0.001)			(0.005)			(0.002)	
Banks x small			-0.002			-0.007**			-0.005***

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Table 4.4: *Continued from previous page*

			(0.001)			(0.003)			(0.002)
Banks x medium			-0.002**			-0.006**			-0.005***
			(0.001)			(0.003)			(0.002)
Banks x large			-0.002**			-0.003			-0.003
			(0.001)			(0.004)			(0.002)
N	17,883	10,166	17,883	17,544	9,973	17,544	17,690	10,050	17,690
# countries	33	33	33	33	33	33	33	33	33
Adj. R-squared	0.046	0.041	0.046	0.181	0.185	0.179	0.166	0.163	0.166

Notes: *** p<0.01, ** p<0.05, * p<0.1

Regressions control for the unreported variables logarithm of GDP per capita, private credit, dummy variables for size (medium and large), the firm being a subsidiary, the firm being publicly listed, the percentage of the firm owned by foreign investors, the percentage of the firm owned by the state, and the firm age in years as well as industry dummies. Errors are clustered at the country level.

Source: Authors' analysis based on data from FSAP reports, Enterprise Surveys, and WDI as described in the text.

Table 4.5: Asset Share and Access to Finance – Cross-Country and Cross-Firm Heterogeneity, Partial Effects

	Account			**Overdraft**			**Loan**		
GDP per capita (log) at:	p25 b/se	p50 b/se	p75 b/se	p25 b/se	p50 b/se	p75 b/se	p25 b/se	p50 b/se	p75 b/se
NBFI, low-end	0.005** (0.002)	0.002 (0.003)	-0.002 (0.004)	0.006 (0.004)	-0.008 (0.009)	-0.024 (0.016)	0.005* (0.003)	0.001 (0.005)	-0.003 (0.008)
NBFI, specialized	-0.002 (0.002)	0 (0.001)	0.002** (0.001)	0.007 (0.005)	0.007** (0.003)	0.006 (0.004)	0.006 (0.004)	0.005** (0.002)	0.003 (0.003)
Banks	-0.002 (0.002)	-0.002* (0.001)	-0.001 (0.001)	-0.008** (0.003)	-0.006* (0.003)	-0.004 (0.005)	-0.006*** (0.002)	-0.005*** (0.002)	-0.003 (0.003)

	Account			**Overdraft**			**Loan**		
GDP per capita (log) at:	p25 b/se	p50 b/se	p75 b/se	p25 b/se	p50 b/se	p75 b/se	p25 b/se	p50 b/se	p75 b/se
NBFI, low-end	0.003 (0.002)	0.003 (0.002)	0.003 (0.002)	0.001 (0.008)	0.000 (0.008)	-0.001 (0.009)	0.007** (0.003)	0.007** (0.003)	0.006 (0.004)
NBFI, specialized	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)
Banks	-0.002* (0.001)	-0.002** (0.001)	-0.002** (0.001)	-0.007** (0.003)	-0.006** (0.003)	-0.005 (0.003)	-0.006*** (0.001)	-0.006*** (0.001)	-0.005*** (0.001)

Notes: *** p<0.01, ** p<0.05, * p<0.1
Table reports partial effects of ordinary least square regressions that control for the unreported variables logarithm of GDP per capita, private credit, dummy variables for size (medium and large), the firm being a subsidiary, the firm being publicly listed, the percentage of the firm owned by foreign investors, the percentage of the firm owned by the state, and the firm age in years as well as industry dummies. Regressions with external dependence interaction term also include unreported level effect. Errors are clustered at the country level.
Source: Authors' analysis based on data from FSAP reports, Enterprise Surveys, and WDI as described in the text.

Table 4.6: Average Size and Access to Finance

	Account	**Overdraft**	**Loan**
	probit	probit	probit
	coef/se	coef/se	coef/se
NBFI, low-end	-0.574***	-0.011	-0.087
	(0.209)	(0.274)	(0.153)
N	18,642	18,238	18,445
# countries	36	36	36
Pseudo Adj. R-squared	0.076	0.110	0.108
NBFI, specialized	0.922	3.159***	1.050**
	(0.869)	(0.781)	(0.533)
N	17,998	17,566	17,799
# countries	33	33	33
Pseudo Adj. R-squared	0.063	0.135	0.107
Banks	0.005	0.143	0.025
	(0.075)	(0.102)	(0.046)
N	22,554	21,983	22,354
# countries	50	50	50
Pseudo Adj. R-squared	0.058	0.104	0.108

Notes: *** p<0.01, ** p<0.05, * p<0.1
Regressions control for the unreported variables logarithm of GDP per capita, private credit, dummy variables for size (medium and large), the firm being a subsidiary, the firm being publicly listed, the percentage of the firm owned by foreign investors, the percentage of the firm owned by the state, and the firm age in years as well as industry dummies. Errors are clustered at the country level.
Source: Authors' analysis based on data from FSAP reports, Enterprise Surveys, and WDI as described in the text.

Table 4.7: Average Size and Access to Finance – Cross-Country and Cross-Firm Heterogeneity

	Account			**Overdraft**			**Loan**		
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se
NBFI, low-end	3.129	-0.097***		16.680*	-0.088		14.036*	-0.112*	
	(4.582)	(0.029)		(9.489)	(0.101)		(7.416)	(0.062)	
x GDP per capita (log)	-0.379			-1.975*			-1.665*		
	(0.542)			(1.128)			(0.880)		
x External Dependence		-0.013			-0.080			0.096***	
		(0.014)			(0.072)			(0.035)	
NBFI, low-end x small			-0.081***			0.076			0.041
			(0.028)			(0.102)			(0.058)
NBFI, low-end x medium			-0.078***			-0.045			-0.034
			(0.024)			(0.101)			(0.061)
NBFI, low-end x large			-0.065***			-0.039			-0.095*
			(0.022)			(0.097)			(0.056)
N	18,646	10,398	18,646	18,240	10,173	18,240	18,449	10,282	18,449
# countries	36	36	36	36	36	36	36	36	36
Adj. R-squared	0.038	0.040	0.037	0.147	0.151	0.143	0.143	0.141	0.140
NBFI, specialized	1.537	0.140		0.970	0.952***		4.372	0.409**	
	(1.996)	(0.122)		(4.240)	(0.213)		(2.797)	(0.206)	
x GDP per capita (log)	-0.179			0.006			-0.489		
	(0.240)			(0.520)			(0.338)		
x External Dependence		-0.149**			0.023			-0.124	
		(0.064)			(0.258)			(0.157)	
NBFI, specialized x small			0.114			1.125***			0.494***
			(0.120)			(0.264)			(0.191)
NBFI, specialized x medium			0.063			1.065***			0.394*
			(0.095)			(0.248)			(0.216)
NBFI, specialized x large			0.034			0.695***			0.123
			(0.091)			(0.263)			(0.167)
N	18,002	10,235	18,002	17,568	10,005	17,568	17,803	10,119	17,803
# countries	33	33	33	33	33	33	33	33	33
Adj. R-squared	0.031	0.033	0.030	0.170	0.179	0.171	0.141	0.141	0.139
Banks	0.553**	0.000		-0.508	0.028		0.175	-0.001	
	(0.242)	(0.015)		(0.681)	(0.039)		(0.405)	(0.021)	
x GDP per capita (log)	-0.066**			0.067			-0.020		
	(0.029)			(0.081)			(0.048)		
x External Dependence		-0.023***			-0.052***			-0.025	
		(0.009)			(0.019)			(0.023)	
Banks x small			0.013			0.086**			0.037**

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Table 4.7: *Continued from previous page*

			(0.014)			(0.038)			(0.018)
Banks x medium			-0.007			0.046			0.010
			(0.010)			(0.037)			(0.018)
Banks x large			-0.010			0.007			-0.020
			(0.009)			(0.032)			(0.017)
N	22,563	11,869	22,563	21,985	11,587	21,985	22,359	11,751	22,359
# countries	50	50	50	50	50	50	50	50	50
Adj. R-squared	0.043	0.040	0.033	0.139	0.150	0.139	0.140	0.149	0.142

Notes: *** p<0.01, ** p<0.05, * p<0.1

Regressions control for the unreported variables logarithm of GDP per capita, private credit, dummy variables for size (medium and large), the firm being a subsidiary, the firm being publicly listed, the percentage of the firm owned by foreign investors, the percentage of the firm owned by the state, and the firm age in years as well as industry dummies. Regressions with external dependence interaction term also include unreported level effect. Errors are clustered at the country level.

Source: Authors' analysis based on data from FSAP reports, Enterprise Surveys, and WDI as described in the text.

Table 4.8: Average Size and Access to Finance – Cross-Country and Cross-Firm Heterogeneity, Partial Effects

	Account			**Overdraft**			**Loan**		
GDP per capita (log) at:	p25 b/se	p50 b/se	p75 b/se	p25 b/se	p50 b/se	p75 b/se	p25 b/se	p50 b/se	p75 b/se
NBFI, low-end	0.768 (1.209)	0.333 (0.588)	-0.044 (0.054)	4.387* (2.470)	2.121* (1.178)	0.162 (0.101)	3.675* (1.941)	1.765* (0.932)	0.114 (0.076)
NBFI, specialized	0.310 (0.355)	0.220 (0.238)	0.057 (0.080)	1.012 (0.703)	1.015** (0.467)	1.020*** (0.259)	1.017** (0.494)	0.720** (0.304)	0.323** (0.146)
Banks	0.152** (0.069)	0.064** (0.031)	0.003 (0.010)	-0.105 (0.194)	-0.016 (0.091)	0.045 (0.036)	0.057 (0.116)	0.031 (0.054)	0.013 (0.018)
	Account			**Overdraft**			**Loan**		
External dependence at:	p25 b/se	p50 b/se	p75 b/se	p25 b/se	p50 b/se	p75 b/se	p25 b/se	p50 b/se	p75 b/se
NBFI, low-end	-0.098*** (0.028)	-0.099*** (0.028)	-0.101*** (0.028)	-0.094 (0.102)	-0.099 (0.102)	-0.11 (0.104)	-0.104* (0.061)	-0.098 (0.061)	-0.085 (0.060)
NBFI, specialized	0.128 (0.119)	0.113 (0.116)	0.098 (0.113)	0.954*** (0.220)	0.956*** (0.232)	0.958*** (0.245)	0.399* (0.204)	0.387* (0.203)	0.374* (0.202)
Banks	-0.002 (0.014)	-0.003 (0.014)	-0.006 (0.013)	0.024 (0.039)	0.021 (0.039)	0.014 (0.039)	-0.003 (0.020)	-0.005 (0.019)	-0.008 (0.018)

Notes: *** p<0.01, ** p<0.05, * p<0.1
Table reports partial effects of ordinary least square regressions that control for the unreported variables logarithm of GDP per capita, private credit, dummy variables for size (medium and large), the firm being a subsidiary, the firm being publicly listed, the percentage of the firm owned by foreign investors, the percentage of the firm owned by the state, and the firm age in years as well as industry dummies. Regressions with external dependence interaction term also include unreported level effect. Errors are clustered at the country level.
Source: Authors' analysis based on data from FSAP reports, Enterprise Surveys, and WDI as described in the text.

Table 4.A: Asset Share and Asset Size by Country

	Asset Share			Mean Assets in bn US$ (constant)			
Country	**low-end NBFI**	**specialized NFBI**	**Banks**	**low-end NBFI**	**specialized NFBI**	**Banks**	**Number of Firms**
Belarus						0.430	273
Benin						0.115	150
Bolivia	15.12	0.34	84.54	0.024	0.021	0.410	613
Bosnia and Herzegovina	2.19	3.24	94.58	0.003	0.039	0.099	361
Botswana	0.55	12.47	86.98	0.001	0.156	0.511	342
Brazil	0.83	5.52	93.64	0.003	0.180	2.668	1802
Bulgaria					0.017	0.665	288
Burkina Faso	21.77	3.24	74.99	0.001	0.010	0.100	394
Cameroon	4.66	10.64	84.70				363
Chile	0.45	1.52	98.03	0.004	0.355	2.481	1017
Colombia	0.74	38.08	61.17	0.024	0.327	0.931	1000
Cote d'Ivoire	1.51	3.73	94.76				526
Croatia				0.026		1.054	633
Czech Republic						1.356	250
Ecuador	4.78	5.89	89.32	0.009	0.013	0.217	658
Gabon	5.49	5.01	89.49	0.005	0.010	0.187	179
Georgia						0.029	373
Ghana	3.35	4.34	92.31	0.000	0.004	0.129	494
Guatemala					0.016	0.385	522
Guinea-Bissau						0.010	159
Honduras	6.31	1.67	92.02	0.072	0.006	0.174	436
Hungary	6.01	11.79	82.21	0.015	0.034	1.325	291
Kazakhstan					0.016	0.093	544
Kenya	17.09	3.09	79.82	0.000	0.042	0.127	657
Kyrgyz Republic				0.000		0.016	235
Latvia	0.06	6.07	93.87	0.000	0.040	0.616	271
Macedonia, FYR	1.27	1.51	97.21	0.003	0.005	0.147	366
Madagascar	5.33	0.27	94.40	0.007	0.002	0.171	445
Malawi	2.88	1.97	95.15	0.000	0.007	0.060	150
Mali						0.138	490
Mauritius	0.68	5.20	94.12	0.022	0.160	0.396	398
Moldova				0.000		0.027	363
Mongolia	0.79	3.49	95.73	0.000	0.000	0.086	362
Montenegro				0.008		0.050	116
Mozambique	2.64	14.21	83.15	0.008	0.075	0.225	479
Namibia				0.000		0.565	329
Niger						0.041	150
Paraguay	11.43	7.86	80.71	0.001	0.012	0.137	613
Peru	3.39	4.36	92.25	0.018	0.086	1.239	632
Philippines	10.34	3.15	86.51	0.007	0.023	1.274	1326
Poland				0.010		1.886	455
Rwanda	5.96	23.35	70.69				212
Senegal	2.05	0.65	97.30				506
Serbia					0.011	0.145	388
Sierra Leone						0.024	150
Slovak Republic						1.584	275
Tajikistan				0.000		0.032	360
Tanzania	0.89	7.06	92.05	0.000	0.013	0.109	419
Togo						0.064	155
Turkey	1.94	3.03	95.03	0.818	0.033	3.464	1152
Uganda	0.98	4.33	94.68	0.000	0.008	0.078	563
Ukraine	0.64	0.46	98.89	0.000	0.002	0.133	851
Uruguay	1.66	15.13	83.21	0.070	0.181	0.833	621
Zambia	1.03	2.64	96.33	0.000	0.003	0.059	484
Total							25641

Source: Authors' analysis based on data from FSAP reports and Enterprise Surveys as described in the text.